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VOL. I.—30TH YEAR. SYDNEY, SATURDAY, MARCH 20, 1943. No. 13.

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SUPPLEMENT NUMBER 11 ON WAR MEDICINE AND SURGERY:
Compound Fractures.

PATHOLOGICAL STATES IN DEMENTIA PRÆCOX AS REVEALED IN A FATAL CASE OF PICROTOXIN MEDICATION.[1]

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THE well-worn subject of a specific or indeed any pathology for *dementia præcox* has been further complicated or enriched by the examination of the brains of such of these patients as have succumbed during convulsive therapy or other treatment as well as of biopsy material from frontal lobes surgically removed. A further help has come from examination of the histopathology of the brains of animals subjected to measured doses of convulsant drugs. A casual glance over the various findings, which at times differ widely from case to case, would suggest that certain patients labelled as suffering from *dementia præcox* had in fact an individual cerebral pathology of their own, which partly accounted for some of their mental symptoms and on certain occasions also was in part responsible for their early and unexpected demise. The recent death immediately after his first picrotoxin treatment of a patient, aged thirty-six years, with a long history of *dementia præcox*, who had been treated at two clinics for acute mental disease, would seem to warrant a review of recent ideas on this subject, especially as this patient had pathological lesions in the medulla. This review will include also findings in subjects dying after convulsive therapy.

[1] Read at a meeting of the Section of Neurology and Psychiatry of the New South Wales Branch of the British Medical Association on July 2, 1942.

Clinical Notes.

The patient was first seen by one of us (W.S.D.) in 1933. He was then aged thirty years. He was said then to have been nervy for eight or nine years, during which period he had been able to continue at clerical work while under medical care. In boyhood he had been fairly sociable, but he became inclined to prefer his own company as he grew older. He was never of a forceful disposition and had never expressed a preference for any special career. His parents were both of a worrying disposition, and a paternal uncle had been subject to attacks of depression. The patient complained mostly of inability to do his work, of physical and more particularly mental fatigability, of a sense of pressure on the head and of some disturbance of sleep. His work had been reported on adversely a year before. His physique was slender, but his general condition was satisfactory; his blood pressure was 100 millimetres of mercury, systolic, and 80 millimetres, diastolic. He was a little vague and hesitant in his statements. He admitted to some sensitiveness and to recent feelings of being looked at. Over the next three months he found it increasingly difficult to keep going; he became more fatigued, and felt that his work was too much for him. He then entered hospital, where he remained for four months, without improvement; in fact, for a while he was aurally hallucinated. Not long after his return home he wandered away and finally entered a police station, unable to give any information about himself. This condition persisted with little variation until the middle of 1937, when he was reported to be "stuporose and difficult to manage". His condition then improved a little, but he never resumed work after 1933. Towards the end of 1938 he became quieter and more disinterested, and was often noticed to gaze into space. He also had some impulsive outbursts.

On his admission to hospital in May, 1939, he was "vacant"; he smiled when addressed, but showed no disposition to discuss his case or to engage in any activity. He was considered to be suffering from *dementia simplex* of some six years' duration. His physical condition was satisfactory; the various bodily systems appeared to be healthy; his weight was seven stone five pounds (best weight, eight stone eight pounds some years previously); his blood pressure was 110 millimetres of mercury, systolic, and 80, diastolic; his age was thirty-six years. He received three injections of "Cardiazol" in doses of 0·5 gramme, productive of convulsive seizures; on one occasion the seizure was severe and pro-

longed. He then received an injection of six cubic centimetres of a solution of picrotoxin (0·15 gramme to five cubic centimetres), and over a period of about fifteen minutes he showed no reaction, either mental or physical. As six cubic centimetres had had no effect, he was then given ten cubic centimetres of the solution, and again no reaction occurred until five minutes later, when the patient had spasms followed by a severe seizure. He was pulseless for about thirty seconds. Although this reaction was severe, it was not more so than those which have occurred sometimes with "Cardiazol". The patient then while still unconscious became restless and had numerous spasms. During this phase the blood pressure was 150 millimetres of mercury, systolic, and 80, diastolic; the previous figures had been respectively 110 and 80. After about five minutes he had another severe seizure; he became pulseless and the respiration also became feeble. Artificial respiration was applied, and he was given "Carbogen" and adrenaline was injected, but without result.

Picrotoxin.

Picrotoxin was suggested as a substitute for "Cardiazol" in shock therapy by Burn (1939), who estimated its action as thirty times as strong. Low *et alii* (1939) reported favourably on its use with doses varying from seven to eleven cubic centimetres of a solution containing three milligrammes of picrotoxin to each cubic centimetre. They noticed a frequent delay of between five and forty minutes between the time of intravenous injection and the convulsive seizure. Additional seizures also occurred from five to fifteen minutes after the first reaction. Later in their series of cases they gave "Seconal" intramuscularly immediately after the second seizure, thereby preventing further paroxysms. None of their patients experienced the terror reactions which are not uncommon with "Cardiazol", and many of them expressed a preference for picrotoxin. The therapeutic effects appeared to be at least as good. However, the delayed reactions, the frequency of after-convulsions and the present unfortunate event all show that picrotoxin is far less safe than "Cardiazol". In a personal communication (September 19, 1940) Low states that picrotoxin is still being used at some State hospitals in Illinois, and expresses the view that its advantages are the absence of fear and the possibility of injecting it into thin veins. On the other hand, the development of the paroxysms after a long interval renders picrotoxin inconvenient for clinical use. During the past year Low and his co-workers have been following up the injection of picrotoxin with a small dose of "Metrazol" after an interval of ten or twelve minutes. Their results with this modified method have since been published.

It remains to be added that Hoffman (1941), discussing shock in air-raid casualties and giving his preference to "Pentothal Sodium" as the anæsthetic agent of choice in these cases, warns his readers that the specific antidote to this substance is picrotoxin and that an ampoule of picrotoxin should always be kept on the operating table and might well prove life saving.

Pathological Report.

In connexion with the cerebral pathology of *dementia præcox* in so far as there is one, the late Sir Frederick Mott laid stress upon the desirability of obtaining material from subjects meeting with sudden death. Unfortunately, in the case under review the patient had experienced several intravenous exhibitions of "Cardiazol" and finally one treatment with picrotoxin; the former treatment is known on occasions to be followed by undoubted dementia, presumably on a histological basis. As with chloroform, so also with "Cardiazol", some histological cerebral effect is probably always caused; but as a rule this effect is associated with curable temporary effects on certain neurones and scarcely affects the glial framework. Hassin (1939) doubtless represents the majority verdict when he makes the following statement concerning the pathology of schizophrenia: "Though structural changes may be found in nearly all cases of this condition, they are not uniform or typical enough to make a diagnosis under the microscope." The changes are parenchymatous and non-inflammatory, involving the third and occasionally the fifth and sixth layers, the fourth and second layers being preserved. The changes in the glia are inconstant and not pronounced. At times small avascular areas devoid of ganglion cells may be found. Now in our case, although the man was only thirty-six years old, with no history of traumatic or infective cerebral illness, yet it will be revealed that he had a generalized and pronounced arteriosclerosis, and a remarkable gliosis, implying not only enlarged and increased numbers of glia cells, but also an extraordinary hypertrophy of the glial framework, especially in the olive and surrounding some vessels of the medulla. Some groups of capillaries were quite obliterated, a scar being left.

Examination of the *cortex cerebri* revealed much blood extravasation in places in the pia. The vessels were engorged and the contained blood seemed affected—that is, clumped or dissolved in part. We must record, too, a peculiar intense yellow staining of the areolar tissue round the larger pial vessels. The pia was distinctly thickened in places. Some of the yellow colour may have been due to collections of the finest hæmatoidin granules. The molecular layer glia held similar pigment. A few petechial hæmorrhages were noted in three areas of the cortex, and the arteriosclerosis of the small vessels was patchy and showed up well with methyl blue. Remarkable to note was the wonderful preservation of the largest neurones in all cortical sections with absence of œdema, while progressively outwards the smaller neurones seemed to present that alteration known as ischæmic. This seemed the main picture here. The same picture holds good for the hippocampus and also for the brain stem, in which the red nuclei and *substantia nigra* were unaffected, but much neuronophagia was in evidence. The caudate nuclei and the lenticular and optic thalami also escaped, with the exception of some patches of neurones in the latter. The Purkinje cells had escaped well, but many neurones in the dentate nuclei were either much swollen or showed axonal degeneration with much shrinkage. A section of both the upper and the middle portions of the medulla were examined by Weigert's method and found normal; but stains like that of Nissl, hæmatoxylin-eosin, and especially Mallory's phospho-tungstic hæmatoxylin revealed many neurones with axonal degeneration, obliteration of a bunch of capillaries near one vagal nucleus, great gliosis in the olives where the neurones were but poorly preserved, and regular collars of hypertrophied glia as well as giant glial cells round some of the larger vessels beneath the ependyma of the fourth ventricle and deeper. With Mallory's stain some of these larger vessels in the medulla revealed an extraordinary perivascular gliosis which we have only twice seen equalled; the subjects on these two occasions were aged over eighty years and had suffered from dementia. In many other vessels arteriosclerosis was apparent, innumerable mononuclear cells being enmeshed. If the age was taken into consideration, a chronic infection of the medulla could not be ruled out. There seems but little doubt that whatever chronic trouble ailed this young man, the brunt fell on the interstitial tissues (mesoblastic and neural) of the medulla, and some being near the vagal nuclei might well have lowered his vital forces in their reactions to convulsive therapy. Many neurones were seen to be enmeshed in the hypertrophied glia.

These lesions in the medulla are scarcely of a nature to have been recently formed, and therefore they seem independent of the picrotoxin and perhaps the other convulsant ("Cardiazol"), of which he had had but three small doses. It is not suggested that they are typical of precocious dementia; but it may be argued that some lesion may be found in such cases if it is adequately looked for.

A discussion on the histological lesions might be considered in the following order: (*a*) post-mortem material from subjects of schizophrenia, preferably dead from sudden accident; (*b*) biopsy material; (*c*) material from subjects after many convulsive seizures induced by insulin; (*d*) material from subjects on whom such powerful drugs as "Cardiazol", "Metrazol" or picrotoxin have been used; (*e*) material from animals subject to fits, or to which poisonous doses of the convulsants have been exhibited. Space forbids more than a passing glance at all these.

Post-Mortem Material.

Jung (1939) asks how schizophrenia can destroy brain cells; he does not ask the specific question how much does the organic disintegration account for the symptomatology. Ferraro (1939) found diffuse encephalopathy in one of two cases and diffuse sclerosis in the other; in neither case was there any inflammatory reaction. Bumke (1929) maintains that in long-standing cases brain changes that are not specific are always present. He discusses Reichert's brain swelling with flattening of the convolutions as a thing apart from brain œdema. He argues with Alzheimer that the neurone is swollen, stains homogeneously and has a small nucleus and stumpy processes, and that the astrocytes are specially involved, the process becoming fragmented. But all these can occur in any mental affection. In chronic cases there is a tendency to cell outfalls in the third layer and to glial hypertrophy. Von Braunmühl, alluding to brain œdema, says that "one need not think of it in terms of such grave pathological changes as we meet with on the autopsy table". We are of the belief that mild forms of this peculiar alteration of the brain substance play a great part in schizophrenia. Brain swelling and brain œdema are not one and the same thing, for swelling is a product of brain water metabolism, the water balance being an endocrine effect. One may well ask whether the effect of "Cardiazol" on the brain circulation is a spasm, a dilatation, or even an actual stasis. Spielmeyer noted these changes in many normal brains and found them in association with intoxications, infections, eclampsia and epilepsy.

Biopsy Material.

Eldridge and Reed (1938), using the silver methods for oligoglia on material from thirteen schizophrenic subjects, five manic depressives and a subject of toxic encephalitis, noted this glia as acutely swollen with pycnotic nuclei. These were chiefly in the white matter, and patchy astrocytic reaction was also apparent. Morel and others, having appreciated the conception that convulsive therapy seemed commonly to have destroyed or at least put out of action certain groups of neurones and that the mental improvement might have been the result of this interference with certain neural pathways, caused one of his patients to undergo the removal of part of his right frontal lobe, with great improvement in behaviour. Examination of the biopsy material revealed a delicate pia, œdema of neurones, some excess of glia cells including the monster type and at times advanced necrosis of cells. Others have done similar work and confirm these findings. Roizin puts it that the convulsive therapy, by causing small areas of cerebral necrosis, interrupts and breaks up the facilitated "circulation" of the anxiety pattern.

Changes Induced by Insulin.

Fits caused by insulin were associated (Ferraro and Jervis) with brains in which loss of ganglion cells and mild glial excess were noted. Small areas of cell waste were found in all cortical layers. New vessels formed, and in all four cases neurone loss was obvious in the Sommer sector of Ammon's horn. The insulin was blamed for this. It is but fair to add that it is maintained that the damaged neurones can recover and the glial tufts disappear—that the condition is reversible.

Changes Induced by "Cardiazol" et cetera.

With inorganic convulsants like "Metrazol" and with soluble barbital, the German school held that there occurred a generalized ischæmia of the ganglion cells, shadow cell formation and a diffuse gliosis. Others have found bilateral softening of the frontal lobes, perivascular lymphorrhages and scattered glial foci. The illustrations reveal microglial hypertrophy and surface glial hypertrophy on the hippocampus and a felted gliosis deeper in, some demyelination and astrocytic glial scars. In the tissues of rabbits that have received two and a half times the human therapeutic dose a similar picture is seen. Hassin noted aseptic meningitis with dilated subarachnoid, œdematous parenchyma and tumefacient neurones. The last-mentioned changes resembled those produced experimentally by injections of organic and inorganic poisons. These changes often appeared more striking in the medulla, especially the olives. However, all these were not important; but what he thought important was the possible irreversible œdema or stasis, when it was severe enough to inhibit the removal of the toxin from parenchyma to arachnoid.

Material from Animals.

In animals subjected to treatment by insulin and "Metrazol", besides some glial excess, the brain vessels revealed thickened walls, but rather by imbibition, and local blisters were noted on the pia from excess of spinal fluid—conditions that were obviously curable. Von Braunmühl considered that most of these changes were on a circulatory basis. In our laboratory we found that the lethal dose of picrotoxin for rabbits was not far beyond an effective convulsive dose in some cases.

Neuropathological Technique.

The most useful stains for demonstrating the perivascular glia proved to be Mallory's phosphotungstic hæmatoxylin and his triple stain. Formalin paraffin sections can be used if the sections are placed in Weigert's mordant number 1 overnight and his mordant number 2 for twenty minutes before they are left in the stain overnight. After the mordants, five minutes each in 0·25% potassium permanganate solution and 1% oxalic acid solution ensure even better results. Mallory himself has suggested a valuable improvement; as a mordant he simply uses a 1% solution of lead chloride for ten minutes. Excellent salmon pink and violet effects are obtained if the sections are taken from absolute alcohol to a 2% solution of ammonia in 95% alcohol for ten minutes, washed and placed in a saturated solution of perchloride of mercury for ten minutes, washed, made yellow with Gram's iodine or Lugol's solution, then decolorized in a 0·5% of "hypo" in weak alcohol, and then stained. After the staining one blots the section and treats it with absolute alcohol, watching the differentiation under the microscope. When the violet and pink are best, the section is blotted and placed in xylol to clear. Mallory's triple stain by Sharp's modification takes only ten minutes. Bottles of 3% potassium dichromate solution and a 10% solution of hydrochloric acid in alcohol keep well. Just before use three parts of the dichromate solution are mixed with one of the acid alcohol; this is good for four hours. The mixture may be dropped on the section, left for seven minutes and poured off, and the acid fuchsin is then applied directly for a minute. The section is dipped in water and the 1% phosphomolybdic acid solution is applied for a minute; the section is again dipped in water, and lastly, the "aniline blue orange G" mixture is applied for another minute; the section is blotted, and then absolute alcohol is applied. Careful differentiation under the microscope is necessary till the blues, reds and orange seem at their brightest. The section should be blotted quickly and the clearing completed in xylol. A warm stage helps the xylol, and sections prepared by both methods need mounting in acid balsam. Mallory's stains need thin sections; a thickness of 7μ gives the best effect. Remarkable results are obtained with cord and nerve sections. Picro-indigo carmine also has a positive value in these cases if the section "mordanting" and differentiation is carried out with weak acid alcohol.

However, the acid alcohol and potassium dichromate solution given above acts excellently as a mordant in this instance, too. Major Vandegrift, of the Johns Hopkins University, has kindly allowed us to view an unpublished article dealing with a fixative he has devised, which is particularly suitable for formalin-fixed tissues. Used for ten minutes on the paraffin section, it has proved conspicuously successful for all the stains and procedures already outlined.

Summary.

1. A case has been reported in which death occurred after picrotoxin medication.

2. Peculiar perivascular glioses and capillary obliterations and olive gliosis were noted in the medulla; they were almost certainly antecedent to any convulsant medication and certainly to the picrotoxin.

3. The histopathology of untreated schizophrenia, as well as that of cases subjected to insulin and to the convulsants "Metrazol" and soluble barbiturates, has been alluded to, and also that of animals similarly medicated.

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PRESENILE DEMENTIA: A BRIEF REVIEW.[1]

By A. T. Edwards, M.B., D.P.M.,

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Of the dementias which occur in middle age—the so-called presenile dementias—two have been labelled under the unsatisfactory term idiopathic; they are Alzheimer's disease and Pick's disease. A third disease, presbyophrenia, which previously was frequently described as a separate entity, is now regarded as being inseparable from Alzheimer's disease.[1][2][3]

Much has been written of late concerning these two eponymous disorders; but it is doubtful whether either merits the distinction of being regarded as a "disease" proper. They probably represent "clinico-pathologic syndromes which are unique only in the aggregate of all their features".[1] Both clinically and pathologically these syndromes merge into each other, and both merge on the one hand into arteriosclerotic dementia, on the other into senile dementia. Both the clinical picture and the pathological conditions vary widely, not only as described by various authorities, but frequently even as described by the same authority at different times.

[1] Read at a meeting of the Section of Neurology and Psychiatry of the New South Wales Branch of the British Medical Association on July 2, 1942.

The following is a composite clinical picture of Alzheimer's disease constructed from the varying descriptions given in the recent literature. The disease occurs generally between the ages of forty and sixty years, though cases have been described in early adult life and even at the age of seven years.[3] The onset is generally gradual, and may be accompanied by hallucinations and delusions. One of the earliest symptoms is loss of memory, which is progressive and finally becomes profound; in the earlier stages there may be confabulations of memory.[3] There follow hyperkinesis and frequently occupational overactivity, with paraphasic talkativeness and complete disorientation. Stereotypy of movement is common,[3] and later focal symptoms dominate the picture—"paralyses, aphasias, apraxias and convulsions",[7] defects in the visual field and palilalia.[3] The dementia finally becomes complete, and is accompanied by contractures and total loss of intelligible, meaningful speech.[9]

A similar composite representation of Pick's disease is as follows. The onset is generally gradual, but may be much more rapid than in Alzheimer's disease. It commences between the ages of forty and sixty years. The early symptoms are akinetic, and are sometimes associated with deep stupor; frequently there is some loss of memory, which, however, is more apparent than real. Emotional accessibility is retained late, and simple forms of intelligence are well preserved. Focal symptoms are much less common than in Alzheimer's disease, and convulsions, delusions and hallucinations are rarely found. The patients remain apathetic and lacking in initiative, and display increasing hebetude and progressive mental enfeeblement. Aphasia is common. Orientation and attention are preserved late in the disease, but finally disappear in a picture of profound dementia. Memory is impaired as the disease progresses; but except in the final stage the defect is not so great as that found in Alzheimer's disease. Physical signs are characteristically absent.[10]

Very few descriptions agree completely with these composite pictures, whilst many are flatly contradictory—for example: "focal symptoms are more common in Pick's disease";[6] "restless activity and stereotypy of movement are typical of Pick's disease";[3] "in Pick's disease, dyspraxia is common",[3] "motor unrest predominates",[10] "there is a preliminary phase of motor restlessness",[3] "an early increase in motor activity",[12] "an almost complete absence of memory",[11] "whilst epileptiform convulsions are not infrequent".[12]

Such contradictory evidence, of which the above is but a selection of fragments, demonstrates the lack of clarity that surrounds the symptomatology of these diseases. Further evidence is provided by the following statements, some from authorities who elsewhere describe a definite differential diagnosis of these conditions. "It may well be that the differences [between Alzheimer's disease and senile dementia] may be no more than can be accounted for by the fact that in Alzheimer's disease the patient is younger and better able to resist the illness."[3] "Pick's disease is clinically indistinguishable from Alzheimer's disease."[4] "There is little clinically specific to distinguish Alzheimer's disease from the usual senile dementia."[7] "A distinction between Pick's and Alzheimer's diseases may be impossible on clinical grounds."[8] "Clinically it is difficult and sometimes impossible to differentiate between these two diseases."[9] "No one set of symptoms distinguish Pick's disease from Alzheimer's disease."[10] "The clinical differentiation between these diseases is very difficult."[12] McMenemy[12] also asserts that many cases are missed, as they occur as a subacute toxic variety of the disorder, the confusional state masking the dementia.

It is not the intention of this paper to deal exhaustively with the pathological conditions involved and with the many theories put forward in explanation thereof. Such theories at present remain in the realm of nebulous speculation. There is a tendency to accept von Braunmühl's theory as correct—namely, that senescence of the brain occurs as a result of the change in the nature of the brain colloids from a more dispersed to a less highly dispersed state.

The senile plaques and neurofibrillary changes considered at one time to be pathognomonic of Alzheimer's disease are now found to be present, although generally to a lesser extent, in senile dementia, and in Pick's disease. "Cerebral changes in Alzheimer's disease are practically indistinguishable from those met in senile dementia."[3] Cases of Alzheimer's disease have been described in which there were many senile plaques, and an absence of neurofibrillary changes.[2] Pick's disease is described as being due to localized cerebral atrophy, the atrophy of Alzheimer's disease being generalized; but Hemphill and Stengel[14] describe a case of undoubted Alzheimer's disease associated with extreme asymmetrical cerebral atrophy, and McMenemy[2] states that "the atrophy of Alzheimer's disease may be so unevenly distributed as to suggest Pick's disease". The pathological changes considered to be so characteristic of Alzheimer's disease are stated to be found frequently in arteriosclerotic dementia,[7] whilst Pick's disease is often associated with definite thickening of the walls of capillary blood vessels.[6]

The ætiology of these syndromes is at present purely conjectural. McMenemy[2] considers that in most cases of Alzheimer's disease there is "an abiotrophic tendency sufficiently definite to be brought about by a minimum of extrinsic influences"; L. Bouman[3] ascribes the changes of Alzheimer's disease to hyper-differentiation—that is, "the over-differentiation which occurs when lost tissue is being replaced", the ultimate result of an unknown irritant. J. H. Biggart,[5] MacDonald Critchley[8] and D. K. Henderson[9] consider a heredo-familial occurrence as favouring a diagnosis of Pick's disease rather than Alzheimer's disease. C. Davison[13] suggests disease or spasm of the cortical vessels as playing an important role in the causation of Pick's disease.

Since Alzheimer first described the condition in 1907, about 170 cases of Alzheimer's and Pick's diseases have been published; of these but a small fraction have been adequately investigated histologically. These conditions probably occur much more frequently than the above-mentioned figures appear to indicate. At Callan Park, in addition to the case reported in this issue of THE MEDICAL JOURNAL OF AUSTRALIA, there are two other cases which undoubtedly belong to this category. It is possible that in many cases in which exogenous factors predominate, the condition is obscured by the confusional psychosis. Much wider investigation is needed, not limited to histological research.

It is apparent that in these dementias we are dealing with either (i) a number of separate disease entities, hereditary, abiotrophic and/or reactive to an exogenous cause, or (ii) a single entity which includes Alzheimer's disease, Pick's disease, presbyophrenia and senile dementia, the ætiology of which includes both constitutional and environmental factors, and the clinical and pathological phenomena of which vary according to the one of these two factors that predominates. The evidence available at present is considered to tend to support the hypothesis that Pick's disease and Alzheimer's disease represent merely increasingly localized and unusually early developments of the same condition, and that this underlies senile dementia.

Summary.

The clinical symptomatology of Alzheimer's disease and Pick's disease has been briefly reviewed. The making of the clinical diagnosis between senile dementia, Pick's disease and Alzheimer's disease is frequently impossible. It is suggested that these three diseases are varying manifestations of a single disease process.

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INTRASTERNAL BONE MARROW GRAFTS OF FŒTAL ORGANS IN MAN: A NEW METHOD OF ADRENAL CORTEX GRAFTS IN THE TREATMENT OF ADDISON'S DISEASE.

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ANIMAL experiments have shown that adrenal cortex can be successfully transplanted in frogs, rats, guinea-pigs, rabbits and cats (see Grollmann), subcutaneously, intramuscularly, and into the ovaries, testicles or kidneys. An attempt has therefore been made to transplant adrenal glands in patients suffering from Addison's disease, in order to substitute the lacking organ.

The transplantation of adrenal cortex from man to man has been attempted repeatedly. Successful grafts, associated with improvement in the patient's condition over a long period of observation, are but few.

Halpern and Arkuschenko (1927) reported a case after one year's observation; Reinhart (1928) and Leschke (1928), and Beer and Oppenheimer (1934), each reported another case after six months' observation. Goldzicher and Barishaw (1937) published a case in which improvement had continued for nine months. These authors were also able to examine their active graft and the diseased adrenals at autopsy. Auslender (1938) claims success in 14 cases of transplantation of adrenal cortex; his paper, however, is not available here in Australia, nor to Loeb in America (1941).

Finally, Katz and Mainzer (1941) reported a case of successful graft after a period of fifteen months' observation. Hurst (1922), Conybeare and Millis (1924), Currie (1924) and D'Abreu (1934) describe attempts with often discouraging results in a few days.

Generally the results of adrenal cortical grafts have not been encouraging, and Loeb in 1941 made the following statements:

> Numerous attempts have been made to transplant an adrenal gland or the cortical cells of a gland from one person to another in the treatment of Addison's disease. These efforts have not met with success up to the present time and the procedure is not to be recommended.

Grollmann (1936), however, stresses the importance of further work on transplantation in his book, "The Adrenals", in the following terms: "a method for the successful transplantation of cortical tissue in clinical cases is highly desirable", and "the great need and value of a method for transplanting cortical tissue in man make it desirable that further studies in this field be inaugurated".

High prices of adrenal-cortical extracts, lack of their supply in wartime, the patient's dislike of frequent injections and of taking sodium salts, and residence of the patient in the country, led to the following experiments.

In accordance with the example of other workers, fœtal adrenal glands were removed aseptically from still-born infants, the cortices were sliced into small pieces the size of match-heads and washed twice in normal saline solution. But whereas previous workers followed the technique of the animal experiments in implanting the graft into testis, kidney, subcutaneous tissue and muscle, I chose the sternal bone marrow as the site of the implantation for the following reasons: (i) because an immediate good blood supply for the grafted tissue would be available in the trabecular meshes of the bone marrow; (ii) because hypernephromata metastasize and grow extensively in bone marrow; (iii) because only the insertion of a sternal puncture needle would be necessary for the actual grafting—a minor operation, easily conducted under local anæsthesia.

It was hoped, as occurs with malignant tumours, that small pieces of adrenal cortex would be seeded in the open blood sinuses of the sternal marrow. While it was evident that the smallest pieces of the graft would be washed into the lungs, it was expected that most of the larger cortical pieces would be caught in the network of the trabeculæ. Preliminary tests of the technique were made on cadavers. It was found that the use of an all-metal syringe for the injection of the graft was advisable, because of the great pressure necessary to force the material through a needle into the marrow. A metal dental syringe of a capacity of two cubic centimetres was made to fit the sternal puncture needle and found to be adequate. Subsequently grafts were implanted in four subjects of heart failure or advanced carcinoma and the graft was recovered at the post-mortem examination after forty-eight hours and ten days respectively. In these two cases the graft appeared to be alive, so far as could be judged from the microscopic appearance. These results being encouraging, two patients suffering from Addison's disease were treated with grafts of adrenal cortex (see Figures I and II).

Reports of Cases.

CASE I.—The patient was in the care of Dr. M. Miller, and the diagnosis was confirmed in consultation with Dr. G. Lendon. She was a married woman, aged forty years, who had complained of extreme lassitude and weakness for the preceding three weeks. She could hardly get about, and she complained of giddiness with poor appetite. She had felt tired since an appendicectomy nine months previously. Her previous illnesses included diphtheria and scarlet fever twenty years earlier and a hernia operation thirteen years earlier. The patient had three children, who were all well. The husband was alive and well. There was no family history of tuberculosis or of Addison's disease.

On examination, the patient was thin, pale and of sallow complexion. Patches of brown pigmentation were visible on her neck and arms. The systolic blood pressure was 76 millimetres of mercury and the diastolic 40. After a month of treatment with tonics without improvement in her condition, the patient was admitted to hospital, and received daily injections of five cubic centimetres of "Eschatin" (Parke, Davis and Company) and capsules containing seven grammes of sodium chloride and seven grammes of sodium citrate. She stayed in hospital for a fortnight, and great improvement in her condition occurred. The systolic blood pressure rose to 90 millimetres of mercury and the diastolic pressure to 48. A consultant confirmed the diagnosis. The weakness returned when the "Eschatin" injections were stopped. An X-ray examination revealed no evidence of calcification in the adrenal areas. The patient was treated subsequently at home, first with daily injections of ten milligrammes of "Percorten" (Ciba) for seven days, then with three injections per week for six weeks, and then with injections twice a week. These injections were additional to the administration of sodium chloride. At this point the patient had a serum sodium content of 322 milligrammes *per centum* and responded to an injection of five units of insulin with a hypoglycæmic attack within fifteen minutes. The pigmentation decreased under treatment and the systolic blood pressure rose to 98 millimetres of mercury and the diastolic to 50.

On August 24, 1941, the patient entered hospital for a sternal bone-marrow graft with the adrenal cortex of a still-born fœtus, 49 centimetres long; the tissue was obtained within one hour of the fœtus's death. During the operation the systolic blood pressure rose from 90 to 110 millimetres of mercury and the diastolic pressure from 35 to 80, for ten minutes; the pressure then fell to 90 millimetres of mercury, systolic, and 35, diastolic, for a fortnight, and then rose spontaneously to 120 millimetres of mercury, systolic, and 80, diastolic. During the period after the transplantation of adrenal cortical tissue, the patient received no cortical extract, no "Eschatin" or "Percorten"; she felt much better than when she was receiving treatment with extracts, but still took sodium salts.

On September 22, 1941, the patient received a second graft of tissue from a fœtus thirty cubic centimetres in length, obtained one hour after death. The blood pressure rose from 120 millimetres of mercury, systolic, and 80, diastolic, to 130 millimetres of mercury, systolic, and 80, diastolic, during the injection, and stayed at this level for seven weeks, when the administration of sodium salts was terminated. The attending physician took the blood pressure first once a week, later once a fortnight. The patient felt well, and did housework, washing *et cetera* without further treatment. In the next months the blood pressure maintained a level of 116 to 120 millimetres of mercury, systolic, and 80, diastolic, but began to fall in July and August, 1942.

On August 24, 1942, the systolic blood pressure was 115 millimetres of mercury and the diastolic was 80; the pulse rate was 66 per minute. The serum sodium content was estimated at 320 milligrammes *per centum*, and the administration of five units of insulin failed to result in a hypoglycæmic attack; the pulse rate and blood pressure were also quite stable after the injection of insulin. The patient feels quite well and has no marked pigmentation; but she feels tired after doing heavy housework.

In this case the diagnosis of Addison's disease was based on the following considerations: (i) the low blood pressure (75 millimetres of mercury, systolic, and 40, diastolic); (ii) the patient's weakness and fatigue; (iii) the skin pigmentation; (iv) the patient's loss of appetite and giddiness; (v) the hypoglycæmic attack that occurred after the administration of five units of insulin; (vi) the response to treatment with sodium salts and adrenal cortical extracts, characterized by rise in blood pressure, loss of pigmentation, increased well-being, increased strength, more appetite, no giddiness, a normal serum sodium content, and no hypoglycæmic attack after the administration of five units of insulin. All the effects of medication with sodium salts and adrenal cortical extracts were replaced and exceeded by the grafts over a period of twelve months.

CASE II.—The patient was in the care of Dr. G. Tassie, and was admitted to the Royal Adelaide Hospital under the care of Dr. Guy Lendon. He was a man, aged forty-two years, with a clinical history of "giddy turns", vomiting, severe loss of energy, increasing dark brown pigmentation of the skin, extreme breathlessness on effort, loss of eighteen pounds in weight and hunger for table salt of five months' duration. One brother had died from tuberculosis.

On examination, the patient was seen to be thin and dark brown in colour. The systolic blood pressure was 75 millimetres of mercury and the diastolic 45; the sodium content of the blood was 298 milligrammes *per centum*. A glucose tolerance test with 50 grammes of glucose produced a rise in the blood sugar level from 0·08 to 0·1 milligramme *per centum*, and then a fall to 0·08 milligramme *per centum*. The red blood cells numbered 4,600,000 per cubic millimetre, the hæmoglobin value was 12·948 grammes *per centum*, and the white blood cells numbered 10,700 per cubic centimetre. An X-ray examination of the kidneys revealed no calcified focus. The diagnosis of Addison's disease was made and the patient was treated with sodium salts and adrenal cortical extracts. He received on eight consecutive days the following dosage: 2·0, 2·0, 13·0, 5·0 and 5·0 cubic centimetres of "Eschatin" (Parke, Davis and Company), then 10·0, 10·0 and 10·0 milligrammes of "Percorten" (Ciba). There was little improvement in general health or decrease in the pigmentation. The blood pressure rose to 84 millimetres of mercury, systolic, and 47, diastolic.

On the fourteenth day of his stay in hospital a graft of a fœtal adrenal gland was made (the fœtus was 20 centimetres long); the daily dose of ten milligrammes of "Percorten" was also continued for eight days. During this period, the blood pressure rose to 145 millimetres of mercury, systolic, and 98, diastolic, and the patient felt slightly uncomfortable with headache. Further "Percorten" treatment was given; on the twenty-fourth day ten milligrammes were given, and on the twenty-sixth and twenty-eighth days five milligrammes were given. There was no treatment on the twenty-third, twenty-fifth and twenty-seventh days.

On the twenty-eighth day, the blood pressure having fallen to 110 millimetres of mercury, systolic, and 60, diastolic, and the sodium content of the blood being 323 milligrammes *per centum*, a further sternal graft was attempted with an adrenal cortex from a full-time still-born fœtus twelve hours after death. The patient showed signs of libido for the first time in six months. From then on he received ten milligrammes of "Percorten" on the thirty-seventh, forty-fifth, fiftieth, fifty-second, fifty-eighth, fifty-ninth, sixty-fourth, seventy-second, seventy-eighth and eighty-second days of his stay in hospital. The blood pressure varied from 110 millimetres of mercury, systolic, and 60, diastolic, to 90 millimetres of mercury, systolic, and 50, diastolic. On the forty-fourth, fifty-sixth and seventy-seventh days, when extra salt and "Percorten" were given as mentioned above, the patient felt nauseated, with a tendency to vomit. He then returned to his country residence, taking five milligrammes of "Percorten" per week. Eight months after he left hospital the systolic blood pressure was 125 millimetres of mercury and the diastolic 85, and the serum sodium content was 322 milligrammes *per centum*.

It is evident that only a reduction in the amount of "Percorten" necessary to keep the patient alive resulted from the graft. This is due probably to the material used for the grafts. The first was fresh, and came from a fœtus only twenty centimetres long; the second came from a full-time still-born fœtus, which, however, had been dead for twelve hours before the adrenal gland could be removed. In view of the unsuitable material, the results are really better than would have been expected.

Discussion and Summary.

The sternal bone-marrow grafts, as described above, produced in the second case a temporary effect on the patient with a reduction of the amount of "Percorten" necessary to maintain an adequate sodium balance and blood pressure; but at both operations the material for the graft was not really suitable. The first graft was taken from a fœtus twenty centimetres in length (four months), which is too small, and the second from a fœtus which, although fully grown, had been dead for more than twelve hours. The fact that in spite of these disadvantages the patient responded shows the value of this method of treatment.

In the first case no better result could have been expected than that obtained; but a few critical considerations have to be added.

No definite conclusions should be made as to the diagnosis of Addison's disease, and as to whether the grafts are alive or not, until the patients are dead and a post-mortem examination with an inspection of adrenals and the sternal grafts is made. The technique described may, however, be useful, either to assist in the treatment of Addison's disease by replacing partly or totally the diseased cortex, or to help a patient with Addison's disease over a period when the function of his adrenal cortex is impaired until remnants of the gland pick up again and completely take over. I hope that these attempts will be repeated in places where there are more cases of Addison's disease, which is rather rare in the comparatively small population of South Australia.

The technique of sternal graft was also employed with success for the transplantation of fœtal bone marrow in a case of aplastic anæmia; but difficulties were encountered with parathyreoid and thyreoid material, which, since it forms sinuses, is almost impossible to force through a needle. Pituitary gland, however, is easily grafted in this way.

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Reports of Cases.

ALZHEIMER'S DISEASE.

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Clinical Record.

(A. T. Edwards.)

A.M.D., a female patient, aged fifty-eight years, was admitted to hospital on February 12, 1940. The onset of her illness had been gradual; it had first been noticed about six years previously. The patient became seclusive, refused to leave the house except under persuasion, and lost interest in her household duties. The usual ineffectual sea trip had been recommended and faithfully carried out, much to the detriment of the husband's small financial means. She gradually became extremely restless, continually wandered from home and refused to be dressed. She would meander aimlessly around the house all night, the sole activity upon which she could concentrate being organ playing. Her speech at first became "queer", and gradually it grew increasingly incoherent.

On her admission to hospital, she was a small, red-faced woman, physical examination of whom elicited no apparent departure from the average. She was unable to cooperate in any way in any neurological examination. She was quite inaccessible and unable to carry out the simplest command. She was continually faulty in habits, having to be led to and from the table and fed. She was obviously completely disoriented. Her sole speech was a ceaseless sing-song of meaningless sounds, kept up for a quarter of an hour at a time, and accompanied by a mirthless giggle. So demented was she that the staff now uses "Mumbling Minnie" as a standard whereby to gauge the severity of dementia. She remained extremely restless, with no change in her mental condition, until her death from lobar pneumonia on August 17, 1941.

The family history is suggestive. One brother became mentally ill at the age of thirty-five years, and two sisters at the ages of forty-six and forty-four years respectively. Unfortunately, these particulars were obtained by letter, and all efforts to obtain further information have been fruitless.

Pathological Report.

The brain was received in 10% formalin solution and to the naked eye the gyri appeared slightly atrophied, with widened sulci and the covering pia somewhat thickened and infiltrated. Over the parietal (Rolandic) area and the frontal area on each side the pia was hæmorrhagic and more turgid, and microscopic examination afterwards revealed that these areas were more severely affected than the rest of the brain.

Sections were taken from the Rolandic area, from the frontal, occipital and central nuclei, from the hippocampus, the brain stem, the cerebellum (peripheral and central) and the medulla near the centre of the olive and also lower down.

The first area mentioned was passed through nitric acid and acetone, fixed in paraffin and stained in hæmatoxylin and eosin; examination by means of Nissl sections, as well as myelin staining, revealed not only isolated neuronal atrophy, but also groups apparently on a vascular basis. The thinned neurones with twisted processes and ischæmic, atrophied bodies were almost entirely filled with pigment. In places the connexion of the hæmorrhagic dilated pia with the brain was hypertrophied; gross subpial felting with numerous amyloid bodies was evident, especially at the bottom of the sulci. Even here it was possible to suspect that condensed circular patches of cortex might take on an argentophile reaction, and so sections were prepared from the other regions enumerated. Some were cut by the frozen method, and when they were submitted to von Braunmühl's silver method almost all the cortex was observed to be filled with argentophile plaques of various sizes. Paraffin sections were treated by the Rogers-Foot silver method, and with this plaques were shown deeper down in the cortex. Myelin staining revealed no deficiency in the cortico-spinal tracts in pons or medulla, and Mallory's phospho-tungstic hæmatoxylin stain as well as his triple stain revealed some hypertrophy of the glial cells in the molecular layer, as well as subpial felting in certain areas. Some of the larger Betz cells were but shadows, whilst in others Nissl bodies and more normal processes were present. The neurones of the optic thalamus especially beneath the ependyma were severely necrosed; shadow cells were present, and in some of the Purkinje cells swelling of their antler was noted, together with centripetal degeneration. An area of softening nine millimetres in width was found in the cerebellum, and the architecture of the cerebral cortex was obscured by the number of extraneous nuclei present. Moderate arteriosclerosis was present, with narrowing of the lumina chiefly affecting the arterioles and the smaller vessels. Apart from the hæmorrhagic pia and smaller gyri, one could not state as in Pick's disease that lobar atrophy was certainly present. Older neurones, such as those of the red nucleus, *substantia nigra* and hippocampus, largely escaped destruction, as did most of the medulla nerve cells. The isle of Reil was noted to be particularly badly affected. Von Braunmühl slides also revealed Alzheimer's neurofibril changes in some of the neurones.

Silver Methods.

The microscopic examination of this brain therefore reveals argentophile plaques in sufficient numbers to support the diagnosis of Alzheimer's disease when the findings are taken in conjunction with the extreme degree of mental hebetude and motor speech disability clinically recognized. It may be argued that the age of apparent onset (fifty-two or fifty-three years) would rather suggest senile dementia, and the pathology is very similar. To quote the words of Stertz as related by Jelliffe and White: "The histological findings are not the expression of a disease process which forms its own laws in the sense of paresis, for instance, but they are the signs of cortical involution which follows its own laws." The differences between senile and presenile dementia are dependent upon the difference in the functional system, which gives out. There is no perceptible difference in the histopathology. Presenile dementia presents a clinical picture indicating a distinct tendency to the localization of the disease process, while in senile dementia the picture indicates a much wider or more general failure. In presenile dementia (Alzheimer's disease) the impressive and expressive functions which mediate the contacts with the external world are affected from the beginning; in senile dementia these faculties are preserved up to the last phases.

Technique.

The silver stains which one might use for the demonstration of these lesions might include the following: (i) Cajal's silver method for frozen sections (one of the best); (ii) Bielschowski's method; (iii) Hortega's silver carbonate stain; (iv) Cajal-Ziehan's gold sublimate stain for neuroglia; (v) von Braunmühl's silver method for plaques; (vi) the Rogers-Foot method for paraffin sections. The first four will be found in any books on pathological technique, but the two last are not so well known here and will now be described.

Von Braunmühl's Method.

F. and F. Wertham, in "The Brain as as Organ", give von Braunmühl's method as follows. (i) Frozen sections of formalin fixed material are cut 10μ to 30μ thick. (ii) They are washed in distilled water and placed in 20% silver nitrate solution in the oven at 50° C. for one-half or three-quarters of an hour. (iii) They are removed from the oven and allowed to cool a little—not for too long. (iv) A row (better a double row) of three dishes is prepared, the first with ammonia water (20 drops of strong ammonia to 50 cubic centimetres of distilled water), the second with distilled water, and the third with neutral formalin in tap water, say 4%. (v) With a glass hook hockey-stick shape three millimetres thick, a section is taken into the ammonia solution till the white matter is transparent. (vi) It is at once whisked into the distilled water and again at once to the formalin solution, not for more than two seconds, and the round is started again. A satisfactory stain should be even in colour, without brown or black spots. Two sections may be needed to bring out the best in both cortex and white matter. Do not allow the section to remain on the glass rod while it is under treatment in any solution. If it is left for too long in the ammonia solution the cortex is spoiled. Scarlet red is a good counter stain; it is splendid for argentophile plaques, mesenchyme and neurofibrils, especially Alzheimer's diseased neurofibrils.

The Foot-Rogers Method.

The Foot-Rogers method is as follows. Tissues must have been in 10% formalin solution for at least a week if formalin is used. Bouin's fluid or Carnoy's fluid without the mercury is best for the more coarsely myelinated fibres. We have had excellent results with axis cylinders from the use of the ordinary formol-xylol-paraffin technique. Others recommend cedar oil or chloroform and paraffin. Sections up to 40μ thick; much thinner sections are suitable. (i) The formol paraffin section on the slide is then passed through xylol to absolute alcohol, and then to a solution of 96% alcohol and 2% ammonia for at least twelve hours. (ii) They are washed or dipped in 80% alcohol. (iii) They are then plunged into a Coplin flask of 40% silver nitrate solution, the temperature of which has been raised to 37° C., for twenty minutes or indefinitely; they are kept in an incubator at 37° C., corked and in the dark. (iv) A warm stage is prepared—a piece of tin supported by two sets of three bricks over a small flame, such as a pilot light; the section is quickly rinsed in distilled water and 20% neutral formalin solution is applied for three to five minutes or indefinitely. (It must be remembered that the whole success of the method depends on the following small points: the temperature of the ammoniated silver solution, the way it is rolled on or along the section, and the various blottings.) (v) The slide is tipped, and weak (say 4%) neutral formalin solution is poured on. If the weather is cold we always leave the slides on the warm stage while we place handy the special silver solution. (vi) The slide is tipped, and five or six drops of the ammoniated silver solution are poured along the section, say with a glass pipe; but first of all the section is smartly blotted, and it is not allowed to dry. This is better done off the warm stage, the section being returned there with the silver fluid. If it is very cold and nothing happens, impatient holding of the flooded section over a naked flame may cause too great a precipitation. The result is usually achieved in a minute or two. It is advisable to wait until the section turns a light brown colour, and to confirm the findings with the microscope. A few axons should be apparent. However, too great an anxiety to see axons at this stage may spoil the section, after the next step with 20% formalin solution has been carried out. The art is in knowing when to stop the silver reaction. (vii) The ammoniated silver solution is poured off, the section is blotted again and 20% neutral formalin solution is quickly applied without any washing. The sections turn a rusty brown colour; after a delay of another five minutes at this stage, the section is washed.

We usually stop here after a few minutes' treatment with 5% sodium hyposulphite solution and careful washing, obtaining black axons on a yellow background. However, the usual gold toning can be applied. One can mount the section in euparol or balsam. Laidlaw has a solution, 1% oxalic acid in 2% formalin, for sharpening the lines after the last

formalin treatment. The gold toning as well as treatment with 4% acetic acid solution may remove excess of black from the interstitial tissues. In spite of the care needed the results are remarkably constant. Three slides may be prepared at a time. The special silver solution is made thus: to 20 cubic centimetres of a 20% solution of silver nitrate, add strong ammonia drop by drop, shaking till the precipitate first formed has just dissolved; now add a further ten drops of strong ammonia and twenty cubic centimetres of distilled water and place the solution in an amber bottle; it will keep for a month or more. The gold solution consists of one gramme in 300 cubic centimetres and four cubic centimetres of acetic acid. Several points are to be noted. Formalin may be neutral or acid. Never rinse off the formalin solution; 4% acetic acid solution is applied if the microscope reveals an excess of black interstitially. Wash out the sodium hyposulphite well. Sometimes Laidlaw's solution is not necessary. The important reduction seems to take place as the ammonia and silver solution is creeping over the warm formalized section. If gold toning is used, the sodium hyposulphite treatment comes after the latter.

Acknowledgements.

We are indebted to Dr. Wise, to Mr. F. Hedger and to Mr. H. Fisher for important help and suggestions in working out the two silver methods.

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UNUSUAL TUMOUR OF THE TONGUE.

By P. D. BRADDON,
Sydney.

Clinical Record.

A FEMALE PATIENT, aged fourteen years, presented herself at the Radium Clinic, Royal Prince Alfred Hospital, with a rapidly growing tumour of the tongue, of only five weeks' duration. It had bled slightly on two occasions; otherwise the only symptoms were caused by its rapidly increasing bulk. On examination, a tumour measuring 2·5 centimetres

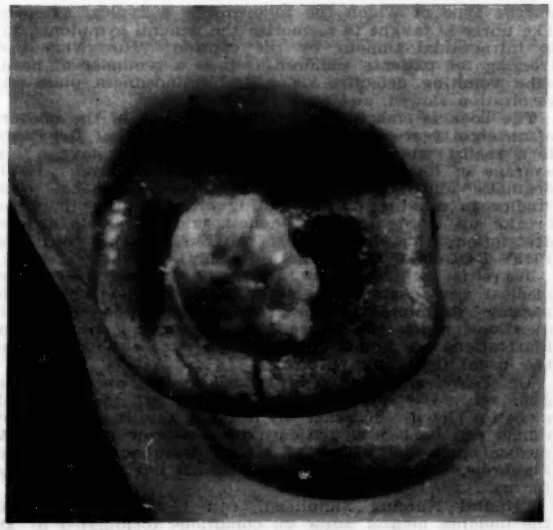

FIGURE I.

by 1·5 centimetres growing from the centre of the anterior two-thirds of the dorsum of the tongue was disclosed (Figures I and II). The tumour was fairly hard and homogeneous, and had a tendency to be pedunculated; the base, however, measured 1·0 centimetre in diameter.

Ten days elapsed before treatment could be carried out, and in that time the tumour rapidly increased in bulk by some 60%, and was breaking down towards the apex and very foul.

FIGURE II.

Under local anæsthesia, the bulk of the tumour was removed, and the base was treated by a permanent gold seed radon implant to a dosage of 6,000 *r*.

Pathological examination showed the growth to be an angio-endothelioma of great cellular activity. The provisional diagnosis had been endothelioma.

Comment.

The result of treatment is excellent, as the patient three months afterwards presents an apparently normal tongue; the implanted gold seeds are not palpable, nor is the patient in any way conscious of them. The prognosis is excellent, as although this tumour had grown with extreme rapidity, it is not considered to be at most more than locally malignant.

HÆMATURIA AND OLIGURIA IN A CHILD FOLLOWING SULPHAPYRIDINE THERAPY.

By S. SHINEBERG,
Tamworth, New South Wales.

Clinical Record.

R.N., aged two years and four months, was first examined by me on January 6, 1943. He had been hot and restless since 1.30 a.m., had coughed occasionally, and was breathing rather quickly. Examination suggested some trouble brewing at the base of the left lung, and at a later visit the same day the diagnosis of early pneumonia was confirmed. Sulphapyridine was prescribed in the form of "M & B 693" tablets, two to be given for the first dose followed by one every four hours. In all eight tablets were given (four grammes of sulphapyridine).

The following morning his condition seemed very much better and he remained well all that day, with no rise in temperature. That night (January 7) he became restless, excited and delirious throughout the night; he was cold and sweated profusely, and complained constantly of pain in the abdomen. Towards morning (January 8) he passed a considerable quantity of dark, obviously blood-stained urine. Similar small quantities of urine were passed, with small dark clots. Pain was constantly present. At this time the administration of sulphapyridine was suspended, and fluids and alkalis were given. Examination of the urine revealed abundant red blood cells, but no crystals at this stage. There were no casts.

The child had several vomiting attacks, yet become more comfortable through the day; but he had a distressful night, waking every hour in severe pain, sweating, and with cold skin. He passed no further urine from the evening of January 8 until 5.30 p.m. on January 9, when a small amount was passed into a napkin, from which a furry deposit was scraped off and examined on a slide; examination revealed abundant quantities of long, narrow, brownish crystals. Pain, vomiting and cold sweats continued to occur, and at one stage during the period of temporary anuria the child appeared to be comatose.

After this dangerous period, the urinary excretion increased; blood and crystals gradually disappeared from the urine over the course of the next few days. One week after the original illness the urine was quite free of any abnormality, and the child was quite well.

Discussion.

The foregoing case is deemed worthy to be reported on account of the dangerous and alarming condition which developed after a comparatively small total dose of sulphapyridine (four grammes in twenty-four hours). Fortunately, just as my thoughts were being directed to preparation for ureteral catheterization (no slight undertaking in a child so young), the crisis passed.

The complication and its treatment are discussed by Hamilton Bailey in *The Medical Annual*, 1942; but the cases reported in the literature refer to massive doses of the drug given over a prolonged period.

Reviews.

A YEAR BOOK ON RADIOLOGY.

"THE 1942 YEAR BOOK OF RADIOLOGY" has been received from the publishers. It is compiled by Charles A. Waters, Whitman B. Firor (at present in Australia) and Ira I. Kaplan.

This is the tenth year of publication, and the present edition is well up to the standard of previous ones. The publishers are preparing a ten-year reference index which should be of the greatest value to specialists in radiology. This is a difficult work to review as it consists entirely of reviews of current publications by many authors. The section on the osseous system covers many new views on some of the unusual diseases which have not yet been stabilized, such as marble bones, hæmochromatosis with joint anomalies, Garre's sclerosing osteomyelitis, tuberculosis of long bones and others. The value of these reviews depends greatly on the excellent illustrations which accompany the various discussions. Fractures of the neck of the femur and vertebral fractures following metrazol therapy are discussed most fully. Various cranial and sinus conditions also are dealt with in a most illuminating manner.

The importance of miniature radiography (photofluorography) is well covered and the various authorities quoted favour the five-inch by four-inch rather than the 35-millimetre method. Christie considers the five-inch by four-inch method, especially when stereoscopic films are taken, as being equal to the single seventeen inch by fourteen inch film.

Gastro-intestinal lesions are well illustrated, and syphilis of the œsophagus and stomach receives special attention. Many rare gastro-intestinal lesions are depicted. The use of radiography in the diagnosis of gastritis and duodenitis is outlined in detail and is most illuminating. The question of duodenal obstruction is discussed at length under the basic headings of congenital and acquired lesions. In a number of lesions of the small intestine (Mayo Clinic) it is shown that malignant conditions of the jejunum are not uncommon, while in the duodenum benign conditions are the rule. Two interesting cases of double gall-bladder are reported.

The genito-urinary system receives particular attention, and here again the illustrations are most informative. Various papers are reviewed on the use of radiology in obstetrics and gynæcology, and the various methods of pelvimetry are discussed and illustrated and case reports are given. Little new work is included in the section on technique, but a very elaborate filing system for teaching in X-ray diagnosis is appended.

In the section on radiotherapeutics there is a most interesting discussion on radiotherapy in wartime by X rays and radium. Very little new work is covered, and perhaps one of the defects of this work is the amount of space devoted to obscure conditions which are rarely met with in the general practice of a radiologist. The section of radiation physics is excellent, but it is of value rather for reference than for general application.

Detailed reports of treatment of various lesions are reviewed in detail and should be of the greatest value to specialists in this branch. To sum up, this is an excellent work, profusely illustrated with beautiful skiagrams, and it should be in the library of every radiologist, whether he practises in the diagnostic or therapeutic branch.

[1] "The 1942 Year Book of Radiology", edited by C. A. Waters, M.D., W. B. Firor, M.D., and I. I. Kaplan, B.Sc., M.D.; 1942. Chicago: The Year Book Publishers, Inc. 9" × 6", pp. 496, with many illustrations. Price: $5.00, post paid.

MENTAL NURSING.

THAT the third edition of "Mental Nursing Simplified", by Dr. O. P. Napier Pearn, should have followed so quickly on a reprint of its predecessor, shows that it has a popular appeal.[1] This fact is worthy of close analysis.

The book suffers from the same defects as were described in a previous review in this journal—"The style and the method do not appeal". It is apparent, however, that the style must appeal to the mental nursing fraternity.

The author claims that the book is intended to be read in conjunction with the well-known "Red Book" published by the Royal Medico-Psychological Association. The nurse is recommended to read first "Mental Nursing Simplified", then to study the "Red Book" and return to Dr. Pearn's handbook prior to the examination. Those who remember the circus, will recall that the clown often stole the attention of the audience from the ringmaster. Our author evidently believes that the clown will be remembered longer than his sedate and serious rival. The "Red Book" is large and highly respectable. This simplified handbook is short and riddled with a quaint brand of humour. The sentences are brief. Frequently the author bursts into verse, such as:

> Bile turns fat into droplets of soap,
> This is not all it includes in its scope;
> It aids peristalsis, and it never ceases
> To prevent putrefaction and colour the fæces.

He is a firm believer in aids to memory. These are of a puerile type of which the following is a typical example. The nurse is taught to memorize the general symptoms due to intracranial tumour by the caption: "How very distressing for patients' children." It is a reminder of headache, vomiting, defective vision, feeblemindedness, pulse and respiration slowed, and convulsions.

The book is embellished by line drawings in the manner of an eight-year-old child. It would appear that Dr. Pearn is a realist who believes that most students have a low average of intelligence. He writes to their level. He is dogmatic and believes that the nurses commence their studies in a state of abysmal ignorance. He, therefore, breaks up words to give phonetic aid and adds a brief description, thus AN-AT-OMY (Greek cutting up) and PHYS-I-OL-OGY (Greek nature study).

There is included a useful list of prefixes in common medical use. Some pages are devoted to the technique of passing examinations and the enumeration of likely questions which the nurse will encounter. Not all the illustrations are humorous—some are excellent examples of the usual text-book pattern.

Dr. Pearn must be congratulated on his unconventional approach. He appears to have discovered an honourable place for clown "education" by teaching that many low-brow minds can be best approached by low-brow methods. As medical men we wish the author were somewhat more highbrow, but must realize that he did not write his book for us.

"Mental Nursing Simplified" can be recommended for the budding mental nurse on conditions formulated by Dr. Pearn himself. It is an aperitive and savoury, but must not replace the "Red Book" which remains the most important course on the intellectual table.

[1] "Mental Nursing Simplified", by O. P. Napier Pearn, M.R.C.S., L.R.C.P., D.P.M.; Third Edition; 1942. London: Baillière, Tindall and Cox. 6¼" × 4¼", pp. 339, with illustrations. Price: 6s.

The Medical Journal of Australia

SATURDAY, MARCH 20, 1943.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

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INDUSTRIAL MORALE.

IN these days when the whole nation is directing its energies to the winning of the war and the field of industry is engaged in the production of the implements of war and in the equipment of the armed forces, the word morale is found on everybody's lips. Some groups of people are said to have a high morale and others a low; a notable achievement in the field or a prime minister's speech promotes a high morale, an unjustified strike or what is thought to be a politician's perversity is said to have the opposite effect. People do not often stop to ask themselves what they mean by morale, and when they do they find that it is extremely difficult to define—most persons have a good idea of what morale is, but cannot put their thoughts into words. Morale is not a form of behaviour; it indicates an attitude of mind that results in certain modes of action. The word morale has been used so much in connexion with the waging of war, either on the battle front or on what has become known as the home front, that its application in any other circumstances than in times of stress is not considered. But even in the days of peace morale may be sought in a person, in groups of persons, in a community, in a nation. To speak of high morale at once implies belief, firm and perhaps unreasoning, in the power of self, in the truth of a creed that has been called in question, or in the righteousness of a cause at combat. Apart from whether the belief is justified or not, it is generally true that the deeper the conviction, the higher will be the morale. In relation to a group of persons, then, morale implies confidence, responsibility, action and cooperation. The morale of an army has been described in the following terms by Sir W. D. Bird, whose words are quoted by Colonel A. Graham Butler in Volume II of "The Australian Army Medical Services in the War of 1914-1918":

> the product of able leadership, of success; of good organization, discipline and training, which produce self-reliance; of religious, or other enthusiasm, superior numbers, better armament, physical fitness, national character, racial pride, early teaching; and, indeed, of any factor which tends to give the leader and troops confidence in themselves and in their power to defeat the enemy. . . .
>
> Of these factors the most important is leadership, for it is generally not so much force as its effective employment that is decisive in war.

This description is diffuse, perhaps necessarily, and its diffuseness shows how hard it is to define morale. Butler also recalls Napoleon's "well known estimate" of the relative significance of manpower and morale as being in the order of 1 to 3; this estimate, he states, has never been challenged. Although the present intention is to discuss morale on the home front, industrial morale, rather than the morale of the fighting forces, Bird's statement and Napoleon's long-standing estimate should be kept in mind. A high morale on the fighting front is essential for victory and will be more easily maintained if there is a solid and ceaseless backing at home; in fact the morale of the whole nation has to be maintained. Those engaged in industry can do more than anyone else outside the front ranks to gain this end.

The value of morale in the pre-war days was nowhere more clearly shown than in industry. A factory with a high morale was one in which the whole staff from the manager to the messenger boy worked in harmony because individual rights and their concomitant responsibilities were equally recognized and a full measure of work was effectively done. Such an organization had achieved an equilibrium that was not upset for very long, if at all, by any disturbance coming from outside or arising within its own walls. Before the war production in quantity was not the vital consideration that it is at present, and manufacturing processes might be undertaken to satisfy the demands of a capricious public. Nowadays the range of manufacture is dictated by military needs and production in quantity is of supreme importance. Industrial morale from being a sign of common sense and social progress, has become a national necessity. In the circumstances attention should be drawn to a recent "analysis of industrial morale" that has been made by Eliot D. Chapple, who is described as an "organization consultant" of Boston, Massachusetts.[1] We have already pointed out that morale is hard to define; Chapple points out that though morale is acknowledged to be vital to the success of any company, it is intangible and difficult to develop. It has been said that there are several kinds of morale—good, bad and indifferent. These descriptions are not really suitable. It is better to speak of high morale and low morale and this will imply the existence of many grades. At the same time it must be recognized that many persons speak of morale as being present or absent; in these circumstances a low morale becomes an absence of morale. Chapple defines high morale for an organization, industrial or not, as "a state of equilibrium in the system of relations such that disturbances to that equilibrium bring about changes in the interaction rates within the normal limits of adjustment, quickly followed by a restoration of the system to a state of equilibrium". This means that each person in the organization has to achieve and maintain a state of equilibrium. Chapple expresses this in another way—that the problem is primarily one of maintaining a proper balance in the autonomic nervous system. In other words an effort must

[1] *The Journal of Industrial Hygiene and Toxicology*, September, 1942.

be made "to prevent situations from arising which will bring into dominance the violent compensatory reactions of rage and fear of the autonomic nervous system with its loss of the ability to adjust, to coordinate, and maintain the complex habits necessary to carry out most industrial routines". Industrial morale may thus be regarded as dependent primarily on the individual himself and secondarily on his ability to adjust himself to his fellow workers, whether he is in a position of control or is so placed that he is controlled by someone else.

It is easier to tell when morale is present in an industrial group than it is to create such a state. When a high morale is present among those engaged in an industrial undertaking it creates an atmosphere which can be felt rather than measured. Chapple gives an example of an undertaking which tried to set up criteria that could be used as evidence of morale. The criteria set up by the Western Electric Company in addition to an increase in output were: (*a*) a decrease in absenteeism, (*b*) an increased amount of social activity among test room operators outside of working hours, (*c*) an increased amount of socialized conversation during the day, (*d*) a willingness to help one another for the common good, (*e*) "pacing" each other in output. In a recent discussion on the effect of wartime industrial conditions on mental health, W. Blood insisted[1] that if mental health was to be maintained in the factory, it was essential that wages, hours of work, security and conditions generally should be satisfactory and should conform to the proved economic and physiological needs of the worker. It is certain that none of the criteria set up by the Western Electric Company would become evident if the conditions so clearly stated by Blood did not operate. When therefore an attempt is made to determine methods by which high industrial morale may be created—and this is the main object of the present discussion—a start may be made with the acceptance of Blood's basic conditions. Mental ill health in a factory may not be attributable to lack of morale, and an absence of morale will not always manifest itself by a failure in mental health, but the same conditions operate largely in the production of morale and of mental health. Morale is something more positive, more assertive, than mental health; mental health may be described as the first stage in the acquisition of morale. Chapple holds, and he will not be contradicted, that if individuals are to make the greatest effort of which they are capable, the organization in which they are placed must be so constructed that the kinds of situations which disturb people emotionally will be very rare. "Care must be taken not merely to see that production is mechanically feasible and that technological bottle-necks and breakdowns are eliminated; it is equally important to see to it that disturbances in interaction do not make it impossible for the technical plant to operate at top efficiency." As Chapple puts it: "Human relations must be looked on as an engineering problem." This is no doubt true and is rather a cold hard fact. Medical practitioners know that in industry as in any other activity man gives of his best when he is in tune with his environment and what Chapple calls organization engineers are no doubt paying increasing attention to the human factor. We have stated that industrial morale is dependent primarily on the individual himself. In the war factories of today medicine is charged with the duty of seeing that the workers enjoy bodily and mental health. This duty is incumbent on medicine whether the nation is at war or not. In wartime, as already stated, production in large quantities becomes the chief aim, and the place of medicine is to keep men and women in such a state of bodily and mental well-being that they can be said to be on the way to acquiring a high morale. Health will not produce morale. The individual must have a conviction, a sentiment, common to others and at the same time very much his own, that his cause is just and his heritage worth defending. He must have imagination so that he can fit his own particular job of work, however small it may be, into the whole war machine as a necessary part of it. If he is not satisfied with the state of society as he sees it, he should be able to use his imagination so that in his supreme war effort he will feel that he is doing something that will help him in the long run to fashion out of the social fabric a structure that is nearer to his heart's desire. To produce this sentiment in the individual is the essential part of the "engineering problem"; the human relations in factory organization must come later. But when all is said and done it must be realized that there is something subtle about morale. All the conditions may be right and morale may not flourish. Morale like immunity in the human body may be inherent in a group of people; it may, when conditions are favourable, be built up by antigens given in small quantities. The antigen may be a small event, a few words by a Churchill or a Roosevelt, an action by a companion, a success by another group working or fighting for the same end in another sphere. One thing is certain—it cannot be bought with honeyed words or cajoled by methods of the nursery. It is the attribute of men, keen, alert and striving for a common cause.

[1] *Proceedings of the Royal Society of Medicine*, August, 1942.

Current Comment.

THE FIRE DISASTER AT BOSTON.

WHAT is known as the Cocoanut Grove disaster occurred at Boston, United States of America, at about 10.15 p.m. on November 28, 1942. This disastrous fire, which resulted in 498 deaths, broke out in a restaurant where a crowd, estimated at 1,000 persons, was gathered to celebrate the victory of a football team. A preliminary account of the disaster has been given by N. W. Faxon and E. D. Churchill, of the West Surgical Service of the Massachusetts General Hospital.[1]

When the fire broke out the dance floor of the main dining room had been cleared for the start of the floor show, and most of the patrons were seated at their tables or crowded in the bar and cocktail lounges. Faxon and Churchill's account of what happened at the Massachusetts General Hospital is important because it shows what kind of organization is necessary in such a crisis, and all who have to do with first-aid posts in the National Emergency Services should read this report to learn what they can from it.

The first patients began to arrive at the emergency ward of the Massachusetts General Hospital at 10.30 p.m., and the hospital was almost immediately notified that it would be receiving a large number of patients. By this time the hospital organization, set up under the civilian defence scheme for the handling of air-raid casualties, had already been set in motion. The necessary staff was called to the emergency ward and the teams organized to

[1] *The Journal of the American Medical Association*, December 26, 1942.

deal with burns and resuscitation were summoned. Nurses, social workers and others were also notified, and by 11.15 p.m. approximately the entire organization for the handling of these patients had been assembled. A surgical ward was evacuated of its patients, and by 1.30 a.m. 39 casualties had been put to bed in the ward. By 1.45 a.m. the burns of all patients, as far as shock and asphyxia would permit, had been completely dressed, shock was adequately treated and asphyxiated patients were receiving oxygen therapy. Between 10.30 p.m. and 12.45 a.m. 114 casualties were received in the emergency ward; 75 were either dead on arrival or died within five to fifteen minutes after entering the door. No patient who lived long enough (fifteen minutes at a maximum) to have resuscitation applied died during the first twelve-hour period. It must be remembered that during November the weather at Boston would be very cold, and it is stated that on their arrival at the hospital, many living patients, in addition to their injuries, showed the effect of fright, cold and exposure. Clothing was dripping wet. Temperatures were taken in the rectum and readings as low as 94° F. were recorded. Exposed surfaces were grimy with smoke, and burned surfaces were blackened. There was little or no evidence of alcoholic intoxication. Faxon and Churchill lay stress on the necessity for immediate examination and for the separation of the living from the dead at the very entrance of the hospital. The need for this was recognized only after a number of dead had been admitted to the emergency ward. At once two resident medical officers were appointed to this duty, and it is stated that in such circumstances the officers should collaborate.

In the immediate treatment of patients, wet clothing was removed and burnt surfaces, except the face, were covered with sterile towels. Every patient received an immediate hypodermic injection of a quarter of a grain of morphine. The burns were treated by a single method. With the exception of one case, there was no cleansing or *débridement*. The burnt surfaces were covered with fine mesh impregnated with boric ointment. Gauze, sterile mechanics' waste, and cotton roller were used to form a bulky dressing. This was compressed with an elastic bandage to form a pressure dressing. Splints of folded newspaper, as suggested by the Red Cross Society, were used for the forearms and hands. A special examination was made of the eyes in every instance. When injuries were found involving the cornea, 5% sulphathiazole ointment was applied and atropine drops were instilled.

Apart from the actual treatment of patients, a great deal of organization was required. The medical staff and the nursing staff were organized and divided into teams for the undressing of patients, the care of clothes and valuables, the administration of morphine and treatment of shock, the dressing of wounds and burns, the administration of oxygen and the carrying out of procedures such as tracheotomy. The identification of the dead took some time. In most instances this was made easy by the finding of cards, letters and driving licences. None of the women had anything on their persons to make immediate identification possible. Their outer coats had been left in cloak-rooms, and they had become separated from their purses and bags. The drawing up of a complete description of each woman and of what she was wearing was not found to be very helpful, and most women were identified after the inspection of bodies by relatives and friends. From this occurrence, Faxon and Churchill recommend the adoption by women of some standard method of identification by bracelet, anklet, or some other method. It was five days after the disaster before all the bodies were identified.

The staff of the hospital received the cooperation of medical practitioners in the neighbourhood. The hospital became for all practical purposes an open hospital, and outside doctors visited their patients and reassured them, often advising them not to seek removal to their own homes or to private institutions. One important defect became obvious. It was impossible for medical officers in charge of the survivors to secure adequate information regarding the character of the trauma. The type of burn and the involvement of the respiratory tract raised the question of poisonous fumes, but evidence on this point was still lacking when Faxon and Churchill made their report. They make the reasonable suggestion that in such a calamity experts should be sent to the scene of the disaster to determine the nature of the trauma, the presence of noxious fumes and so on—and this as an aid in the treatment of casualties. They also think that the dead should immediately be examined by competent pathologists who would straight away communicate their findings to the clinicians. One of the most important aspects of this report is that dealing with the help given by members of the social service department and other non-medical workers. Members of the social service department knew the hospital and its personnel and knew what the function of the different hospital departments was. They were also experienced in dealing with persons who were emotionally disturbed and knew how to conduct an interview. Among the different matters requiring the attention of such workers were the following: (*a*) inquiries about casualties; (*b*) offers of volunteer service; (*c*) requests for permission to act as blood donors; (*d*) applications for lists of casualties from various organizations; (*e*) requests from doctors and reporters about the injuries and identification of both living and dead. The social service department took over the enormous task of interviewing relatives. And not the least important in sustaining energy and morale was the serving of coffee and sandwiches by members of the Red Cross Society and the dietary department.

Faxon and Churchill insist that the training previously received by everyone concerned in the work carried out at the hospital after the disaster, was mainly responsible for the fact that duties were rapidly, efficiently and intelligently performed. The grim experience at Boston shows beyond question that regular training will prevent panic and allow the grave emergencies of a crisis to be met with calmness and efficiency.

THE TREATMENT OF DELIRIUM TREMENS.

To treat patients suffering from *delirium tremens* solely by sedatives is to ignore the pathological basis of the condition. Kinnier Wilson points out that alcohol has a direct action on the neurone and that among the changes noted are swelling and vacuolation of cortical and other cells. He also states that œdema of pia spaces, a condition known as "wet brain", is characteristic of *delirium tremens* and amounts almost to a serous meningitis. He quotes Nuzum and Le Count as having found that the "hydration capacity" of twenty *delirium tremens* brains was much in excess of that of a large variety of others. Writing in *The Journal of the American Medical Association* of December 16, 1916, J. J. Hogan described a method of treatment in which he used intravenous injections of sodium bromide, sodium chloride and sodium bicarbonate. He also gave intravenous injections of high concentrations of glucose. E. A. Cannon and some fellow-workers have described a method of treatment which is in some respects an extension of that described by Hogan.[1] They use an intravenous injection of 50 cubic centimetres of a 50% solution of dextrose with eight cubic centimetres of vitamin B_1 (approximately 25,000 units) and 25 units of insulin. This mixture is given in one injection as soon as the diagnosis is made and no sedation is used. It is stated that in the course of two hours the patients become quiet and calm and declare that they feel well. Usually one injection is sufficient. The patients are then put on to a light diet. The dextrose, we are told, decreases the cerebral œdema temporarily; the insulin stimulates the appetite and allows the sugar to burn in the presence of vitamin B_1, preventing the return of the œdema; the oxidation of fat is reinitiated. This treatment has been used in 15 cases with complete success. Cannon and his fellow-workers think that chemical investigations may determine the exact roles played by the vitamin B_1, the insulin and the dextrose.

[1] *The Journal of the American Medical Association*, August 22, 1942.

Abstracts from Medical Literature.

THERAPEUTICS.

Sulphadiazine.

W. A. KEITZER AND J. A. CAMPBELL (*The Journal of the American Medical Association*, June 27, 1942) describe renal complications of sulphadiazine. Hæmaturia, renal colic and anuria have been recorded with varying frequency following sulphapyridine and sulphathiazole. It has been stated that these complications do not occur with sulphadiazine on account of its solubility. The authors report 11 cases of renal complications due to sulphadiazine. Renal pain, oliguria, anuria and hæmaturia occurred, usually about the seventh day of administration. Cystoscopy and catheterization of the ureters revealed orange-coloured calculi or crystals in the ureters and bladder. Intravenous injection or large oral doses were the cause of these ill effects. A sudden concentration of the drug resulted and caused anuria in thirty-six to forty-eight hours. Dehydration, with a low intake of fluid, even with an average of four grammes of sulphadiazine a day, gave rise to renal complications. Defects of the urinary tract, such as partial obstruction, associated with hydronephrosis or prostatic obstruction, allowed concentration of the drug and crystal formation. The authors conclude that the safe dose is not more than four grammes a day, and that a concentration in the blood higher than eight milligrammes per 100 cubic centimetres is not advisable. In those patients whose reports are submitted, the blood content was between 9·5 and 15 milligrammes per 100 cubic centimetres, and the average daily dose was 5·5 grammes. Treatment is to stop the drug, force fluid up to 5,000 cubic centimetres, examine with the cystoscope and catheterize the urters if oliguria and anuria persist. Ureteral catheters should be left in for twenty-four to forty-eight hours until the flow of urine is clear. Irrigation of the kidney is performed with warm 2·5% sodium bicarbonate solution or isotonic saline solution.

The Treatment of Underweight with Insulin.

J. B. GRECO *et alii* (*The American Journal of the Medical Sciences*, August, 1942), in a discussion on the treatment of underweight with insulin, state that insulin by vagal action produces hypermotility of stomach and hunger sensation and that this action is enhanced by the hypoglycæmia which results. Besides, insulin in sufficient amounts brings about an increase in the amount of gastric and biliary secretion and consequently a better digestion and assimilation of food. Insulin is injected only once a day, forty-five minutes before the midday meal; a commencing dose of eight units is given and the dose is increased according to the patient's appetite on the previous day, but the dose never exceeds 30 units. When the desired effect is attained with a sufficient gain in weight, the administration of insulin is discontinued gradually in the inverse dosage of the beginning of treatment. All patients gained weight, this gain varying from one to twenty-seven pounds (average 8·7), and all had an increased appetite, as well as increased palatability of the food. All 30 patients in this series were healthy persons with no other complaint except underweight and lack of appetite. The authors show that the action of insulin is not a psychic one. The patients in this investigation had an average of 19·3 units of insulin daily for an average of thirty days, and their average weight was 109·8 pounds before treatment and 118 pounds after treatment.

Radio-Phosphorus.

T. FITZHUGH AND P. J. HODES (*The American Journal of the Medical Sciences*, November, 1942) describe the effect of treatment of certain blood dyscrasias with radio-phosphorus. The substance is given either orally or intravenously in doses of from one to twenty microcuries. A solution is prepared which contains dibasic sodium phosphate rendered radioactive by bombardment of ordinary red phosphorus by very rapidly moving deuterons generated in the cyclotron. The oral dose is less than three grammes, the intravenous dose less than one gramme. The diseases treated included eight cases of polycythæmia, five of chronic myelogenous leuchæmia, four of chronic lymphatic leuchæmia, five of Hodgkin's disease, six of lymphosarcoma, and several obscure blood dyscrasias. The authors conclude that the results are at least equal in value to those obtained by older methods of radiation therapy in certain of the malignant blood dyscrasias.

Sulphocyanates.

V. S. CAIRNESS, T. L. UMPHLET AND C. L. ROYSTER (*The American Journal of the Medical Sciences*, November, 1942) discuss blood pressure and the sulphocyanates. They state that sulphocyanates are naturally present in the body in a much higher concentration than any other known depressor substances. In 241 persons the blood sulphocyanate content ranged between 0·31 and 2·55 milligrammes per 100 cubic centimetres of blood. This sulphocyanate percentage varied but little. The blood pressure in this series varied in inverse ratio to the blood sulphocyanate concentration. Both systolic and diastolic pressures were high when blood sulphocyanate content was low, and *vice versa*. In the treatment of hypertension the authors recommend rest, if necessary in bed, and avoidance of over-eating and undue effort or worry. Half a grain of phenobarbital is given on rising and at noon, not in the evening, so as to avoid hangover. Potassium sulphocyanate is given in doses of five grains after breakfast. Blood concentration is tested once a week. An attempt is made to keep the concentration between 2·5 and 8 milligrammes *per centum* by varying the dose and noting the effect of the drug. The dose is rarely increased above five grains a day. Contraindications to the use of sulphocyanates are advanced age and cardiac decompensation. Persons with advanced hypertension do not respond so well as those less severely affected. Of 136 patients treated, 92 showed a reduction of at least 15% in both systolic and diastolic pressures after three months' treatment. Symptoms were relieved in the majority of cases. The authors state that in view of their findings the use of sulphocyanates need no longer be regarded as empirical.

Paralysis Agitans.

W. C. LOUGHLIN, H. A. MYERSBURG AND H. WORTIS (*Annals of Internal Medicine*, September, 1942) discuss treatment of *paralysis agitans* with vitamin *B*. Jolliffe and Spies reported good results from intravenous injection of pyridoxine (B_6), 50 to 100 milligrammes daily. Other authors have not recorded similar results. In this report twelve selected cases are described. Vitamin *B* complex including 100 milligrammes of pyridoxine was injected intravenously daily. Several patients stated that they felt much better after two weeks' treatment, but the majority did not continue treatment. Two patients who continued the treatment claimed that they felt better, but no objective improvement was observed. As the patients had been told that they were having vitamin *B* treatment and that good results were expected, it appeared that any benefit was probably psychological, though some subjective improvement may have occurred.

NEUROLOGY AND PSYCHIATRY.

Megasigmoid in Catatonic Stupor.

L. KERSCHBAUMER (*The Journal of Nervous and Mental Disease*, November, 1942) believes that a more or less severe involvement of the vegetative nervous system can be expected, particularly in advanced mental disease, and he quotes a case in which the symptoms of acute intestinal obstruction occurred as an epileptic equivalent. The symptoms of megasigmoid and coprostasis occur not infrequently in deteriorated schizophrenics. The author cites the case of a schizophrenic who had been in hospital for a long period and who after many years of catatonia developed a prominent abdomen. A laparotomy was performed on the assumption that the mass in the abdomen was a pelvic tumour. Megasigmoid was found, the sigmoid occupying at least two-thirds of the abdominal cavity. Peristalsis was absent and the organ was completely atonic. The occurrence of this condition could be explained only on the ground of poor functioning of the vegetative nervous system in a patient suffering for many years from catatonic stupor.

Cerebral Air Embolism.

AIR embolism as a complication of various obstetrical conditions has been known for many years and Leo Rangell (*The Journal of Nervous and Mental Disease*, November, 1942) reports a case following the assumption of the knee-chest position on the seventh day after parturition. The patient passed into a state of deep coma which was followed by convulsive phenomena of the Jacksonian type and then by a period of mental confusion which lasted several days, but gradually cleared completely. The author discussed the possibility, in the absence of a patent *foramen ovale* or *ductus Botalli*, of intravenous air passage from venous to arterial systems across the

barrier of the pulmonary capillaries. On theoretical and experimental grounds he considers this possible. He thinks that the original introduction of air into the circulation was by way of the dilated and patent uterine veins. He draws attention to the fact that such cases may end fatally.

The Electrical Shock Treatment of Psychoses.

COMMENCING with historical references to the use of electricity in the treatment of the psychoses, William Furst (*The Journal of Nervous and Mental Disease*, November, 1942) passes to the use of electrically induced convulsions in the treatment of the biogenetic psychoses. He describes the apparatus used and the technique to be followed, and he discusses the selection of patients, contraindications and preparation for treatment. Among the contraindications he lists generalized arteriosclerosis, severe cardiac disease, advanced bone disease, neurological disease, syphilis, tuberculosis and thrombophlebitis. He considers the technique simple and the procedure superior to the use of intravenously administered analeptics. Electro-shock dissipates fear and discomfort associated with chemical convulsants. The author believes that electro-shock is superior in the treatment of mania to that by "Metrazol"; and that patients with severe psychoneurosis also benefit from this form of treatment. Of the patients under review 73% of those with affective psychoses and 24% of those in the schizophrenic group were able to be discharged from hospital in a comparatively short time.

Mental Health Problems in a War Production Area.

THE material used by Joseph Andriola (*Mental Hygiene*, October, 1942) for a discussion on mental health problems was gathered from one of the chief production centres in Michigan, United States of America, and deals with (*a*) marital discord, (*b*) budgeting difficulties, (*c*) broken homes, (*d*) mothers working in war industries, (*e*) sexual deviations and (*f*) discrimination against aliens. The author suggests that marital discord may result from fatigue and urges that war industries should be so organized that individuals are not pushed to the point of fatigue. In addition to the sensible adjustment of working hours, he pleads for the avoidance of unnecessary noise, the use of music and short rest periods. To assist proper family budgeting the writer insists on the elimination of all time-payment credit retail selling for the duration of the war. A factor in preventing the so-called "broken home" lies in giving proper consideration to the trauma which may be inflicted on the family by the call-up of certain men for the fighting services. It is pointed out that Britain has witnessed a 50% increase in juvenile delinquency during the war and that 75% of this is attributable to homes broken by the conscription of fathers for war and mothers for war work. In areas where a large proportion of the mothers are employed in war production proper day-care centres for children should be established. Mothers should be examined by trained social workers before being passed for employment. The author has been unable to satisfy himself as to the soundness of the general belief that during war cases of sexual deviation in adolescents tend to increase, and suggests that if such problems arise they are best met with the provision of adequately supervised recreational facilities in the community. Though a far smaller problem than it was during the last war, discrimination against aliens still exists, and may best be combated by their being cleared through one central agency.

Two Factors in the Prognosis of Alcoholism.

J. M. NAGLE (*The Psychiatric Quarterly*, October, 1942) contends that the correct approach to the study of alcoholism is to remember that the consumption of alcohol in beverage form is entirely a personal equation. He describes in detail an alcohol susceptibility test, in which an intradermal injection of 0·03 cubic centimetre of a certain percentage of alcohol is used, with a normal saline solution control, and the size of the resulting wheal is measured. The test is simple and valuable because each individual has a maximum tolerance for alcohol beyond which he becomes intoxicated and unable to enforce either self-denial or self-control. The writer believes that the outlook for the alcoholic patient may be determined by gaining a knowledge of his personality and by ascertaining whether he possesses the ability to enforce self-denial. Reeducation forms the basis of treatment which must be carried out while the patient is segregated in hospital.

Treatment of Spinal Block by Means of Repeat Spinal Air Injection.

BEING somewhat unimpressed by the results of laminectomy in the treatment of spinal block by local arachnoid adhesions, Howard McIntyre (*The Journal of Nervous and Mental Disease*, December, 1942) suggests a method whereby air is introduced under moderate pressure into the spinal arachnoid. When the presence of the block has been established by the Queckenstedt test, 15 cubic centimetres of spinal fluid are withdrawn and 30 cubic centimetres of air are forced in under moderate pressure until the block is cleared. This procedure may have to be repeated several times at intervals of a week or more until finally when the lumbar puncture needle is introduced pressure on the jugular veins causes an immediate and sharp rise of cerebro-spinal fluid pressure. The presence of air in the cerebral ventricles should be demonstrated by X-ray examination after its successful introduction into the spinal theca.

On the Use of Curare in Modifying Convulsive Shock.

LAWRENCE F. WOOLLEY, JACK R. JARVIS AND G. S. INGALLS (*The Journal of Nervous and Mental Disease*, December, 1942) advocate the use of curare in preventing the accidents and injuries incidental to convulsion therapy. They used curare in the form of "Intocostrin" (Squibb) in the approximate dosage of 1·1 milligrammes per kilogram of body weight. The administration by the intravenous route should be made slowly—the injection taking from 30 to 120 seconds; and maximum curarization is said to occur between 150 to 210 seconds later. The drug may be given intramuscularly to patients with poor veins: in this case it will be necessary to use 1·860 milligrammes per kilogram of body weight and the maximum effect will be obtained from thirteen to fifteen minutes later. The use of curare requires a somewhat higher dose of the convulsant to achieve the fit; and if the curare is given intravenously the convulsant must be injected between the second and fifth minute, otherwise the paralysing effect of the curare will commence to pass off. The authors consider the use of curare as having a definite place in the prevention of the injuries, especially fractures, that are known to complicate a percentage of cases in which the patient is treated by chemically or electrically induced convulsions. They claim that its use is quite safe, though it may introduce certain hazards into the treatment, such as respiratory failure. Should this occur, artificial respiration combined with injections of prostigmin and adrenaline have been found effective. Neither the blood pressure nor the heart's action was found to have been seriously affected in any of the cases under review, and the clinical results of convulsion therapy under the protection of curare were found to equal those previously obtained without it.

Biological Concepts in Psychiatry.

F. M. HARRISON (*United States Naval Medical Bulletin*, April, 1942) states that emphasis placed on the study of man in biology has made possible a more comprehensive and a more intelligent understanding of the human organism, a fact of momentous importance to the study of medicine in general and psychiatry in particular. The modern physician continues to be obsessed with the feeling that he must discover a defect in structure in order to account for disease. However, functional disease constitutes from 60% to 70% of medical practice. The search for organic lesions is important, but will never bring about a complete understanding of disease; whereas functional disturbances command interest only as long as they are considered to be diagnostic problems. To say that an individual has a neurosis because no demonstrable pathological change can be assigned to him, is wrong and not even logical, for the ultimate causes of these disturbances of function are to be found in the influences emanating from the intellectual and emotional life of the patient, and they may affect in one way or another any portion of the body. There is justification in drawing a hard and fast line between organic and functional disorders, but the patient often fears the stigma of consulting a psychiatrist and too often has to be content with therapeutic nihilism. The medicine of the future, in addition to being concerned with the anatomical structures of the patient, must interest itself and include in its survey the important problems of human behaviour, social relationships, emotional maladjustments and personality disorders of all types, for whatever fields we touch in medicine we find ourselves in the presence of problems that can be approached in an intelligent manner only from a psychobiological point of view; each individual must be considered as a psychosomatic unit.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Section of Neurology and Psychiatry of the New South Wales Branch of the British Medical Association was held on July 2, 1942.

Pathological States in Dementia Præcox.

DR. OLIVER LATHAM read a paper by himself and LIEUTENANT-COLONEL W. S. DAWSON entitled "Pathological States in Dementia Præcox as Revealed in a Fatal Case of Picrotoxin Medication" (see page 245).

Presenile Dementia.

DR. A. T. EDWARDS read a paper entitled "Presenile Dementia: A Brief Review" (see page 248).

DR. G. L. EWAN thanked the speakers for their papers; he said that he had listened to them with interest and appreciation. At the present time, when there was an increased interest in analeptic drugs, he thought it behoved those present to pay more attention to their pharmacology. It was also interesting to make comparisons; for example, tetanus toxin could be isolated from a culture, and when it was injected into animals it was absorbed by the nerve endings, travelled up the nerves and acted on the centres in the cord; there it was apparently destroyed, for if an emulsion of the cord was injected it was harmless. That, of course, was different from what occurred in the case of strychnine. Picrotoxin had been shown to be essentially a medullary stimulant, and it was therefore not surprising to find in Dr. Latham's microscopic sections that the greater part of the morbid changes had occurred in the medulla. Dr. Ewan had been particularly interested in the nature of the perivascular changes demonstrated; although Dr. Latham had inferred a *propter hoc* rather than a *post hoc* relationship of the morbid changes, it appeared to him (Dr. Ewan) that they might be consistent with what would be expected to occur in an acute irritative process, especially in view of the clinical history. Dr. Ewan had not known any pharmacologist or physiologist to advance a satisfactory explanation of the fact that direct stimulation of the medulla produced convulsions. "Cardiazol", on the other hand, was considered to stimulate the cerebral cortical centres directly.

Dr. Ewan then referred to Dr. Edwards's discussion of the differential diagnosis between presbyophrenia, Alzheimer's disease and Pick's disease. He said that he had to confess that he had been somewhat confused after the first part of the paper; but this confusion had been dispelled by the second part, in which Dr. Edwards had differentiated the cardinal features of each condition. Dr. Ewan thought it would be conceded that a patient of middle age with established dementia presented a striking clinical picture. He believed that, provided that cerebral tumour and syphilis could be excluded, and provided in addition that accessory signs or symptoms such as aphasia, apraxia or agnosia, or the occurrence of seizures were present, one could be confident that the patient was suffering from Alzheimer's disease. He was sure that if such subjects were ultimately submitted to autopsy, the typical pathological lesions associated with such a condition would be found; moreover, it was probable that earlier diagnoses would be made possible if more time was available to the officers of the Division of Mental Hygiene to be devoted to such clinical studies.

DR. C. A. HOGG said that he had listened to the two papers with great interest. Dr. Edwards had carried out free research and had given a comprehensive description of the presenile dementias; he had shown that some difficulty still existed in the diagnosis of the various dementias, and that differentiation was not easy. With regard to Dr. Latham's paper, Dr. Hogg said that he was of the opinion that the lesions shown in the microscopic slides were old, and that they were not caused by picrotoxin. A number of years previously picrotoxin had been used for epilepsy by himself and others in the form of Gelineau dragées, which consisted of picrotoxin, antimony arsenate and potassium bromide; however, the dose of picrotoxin used was subconvulsant. The drug in that form had caused no unpleasant symptoms, except perhaps a little tremor.

DR. G. TRAHAIR said that he was in agreement with Dr. Edwards that presenile dementia was of more frequent occurrence than was commonly supposed. However, Alzheimer's disease itself was rare; the common condition was that in which the patient simply presented premature symptoms of senility. With regard to the difficulties of differentiation between types of presenile dementia, Dr. Trahair said that he recalled a case of Pick's disease in which Dr. Gilbert Phillips had carried out a small volume encephalographic examination and had been able to reveal the presence of bilateral frontal lobe atrophy. Dr. Trahair also mentioned a patient suffering from apparently typical presenile dementia who had come under his care. The diagnosis seemed reasonably certain; but although no abnormalities of the eye reflexes or any other suggestive signs were present, the Wassermann test produced a positive reaction with the cerebro-spinal fluid and the gold sol test produced a result in which the figure five occurred several times at first.

DR. J. A. H. MCGEORGE said that he had found both papers of considerable interest. That by Dr. Latham revealed some new aspects in the study of schizophrenia. Dr. McGeorge presumed, although the fact had not been mentioned, that the case described was one with which he personally was concerned. If so, he could add some facts to those already stated. During the years 1933 and 1939 the patient's condition varied from time to time. There was a period of six to nine months during which it considerably improved, and he carried on his work reasonably satisfactorily. He relapsed again and was returned home from the country in a dull and apathetic condition. When examined again in 1939, he was mute, resistive, refusing food and indifferent to everything around him. He showed all the typical signs of the catatonic form of schizophrenia. He was admitted to the Royal Prince Alfred Hospital, where he received three injections of "Cardiazol", with benefit. The rest of the story had been told by Dr. Latham.

Dr. McGeorge went on to say that it would be a sorry thing if Dr. Latham's findings were proved to be present in all cases of schizophrenia, for it would cause a reversion to the physiogenic theory of the causation of the condition. If it was established that some cerebral pathological condition was present, then the use of no form of convulsant therapy was justified, for it was obvious that such treatment could not possibly be of benefit in, much less cure, an organic disease of the nervous system. Dr. McGeorge said that that would make schizophrenia once more the "Cinderella of Psychiatry", as it had been so aptly termed by Dr. R. S. Ellery.

Dr. McGeorge sympathized with Dr. Edwards in his difficulties in obtaining a satisfactory clinical picture of the presenile dementias. Dr. McGeorge had experienced a similar difficulty when collecting information for a paper on the same subject a few years earlier. He found that one authority would carefully describe a certain clinical syndrome which he would claim to be characteristic of Pick's disease, while an equally eminent authority would emphatically state that the same syndrome was typical of Alzheimer's disease. Dr. Edwards was to be congratulated on having thrown some light on a confused and obscure subject. Dr. McGeorge regarded both papers as valuable contributions to the study of the respective subjects. He felt sure that Dr. Edwards's "Mumbling Minnie" would become famous in the archives of psychiatry.

Dr. Edwards, in reply, said that he hoped with Dr. McGeorge that it would not be accepted that schizophrenia was due to an irreversible organic process, until that was proved conclusively, otherwise there would be a tendency to revert to the therapeutic nihilism which surrounded the *dementia præcox* concept. Dr. Edwards considered that the spontaneous remissions, and also the recovery which occurred as the result of convulsive therapy, were evidence against the suggestion that a permanent organic change was present. Dr. Edwards's own theory of the valuable effect of convulsive therapy was similar to that mentioned by Dr. Latham—that certain temporary changes occurred in the brain, whereby there was some failure of continuity between the conflict and the emotions.

Naval, Military and Air Force.

CLINICAL MEETING AT THE 119TH AUSTRALIAN GENERAL HOSPITAL.

A CLINICAL MEETING was held on August 23, 1942, at the 119th Australian General Hospital, Australia. The meeting took the form of a number of clinical demonstrations by members of the medical staff of the hospital. Part of this report appeared in the issue of December 12, 1942.

Hysteria.

MAJOR V. C. MCCARTHY showed a Jugo-Slav, aged twenty-nine years, who had been for four years in Australia, and whose wife and child were in Europe. He had had five months' military service, having been conscripted in Darwin. His standard of education was poor, and his history was obtained through an interpreter. The patient had sustained an injury to the dorsal region two years earlier, when an agricultural scarifier overturned. He had spent sixteen months in a hospital in Western Australia, in a plaster bed; he had been treated with diathermy and massage, and wished that he could have died. He then worked as a cook's "offsider". Two months prior to his admission to the 119th Australian General Hospital he had been classified as of standard IIB by an Australian Imperial Force medical board; limitation of flexion at the right hip joint was the only disability noted. He avoided physical training, but had been ordered on physical training parade one month earlier, and had "ricked" his back; he had been disabled since. The patient had previously been treated at two military hospitals.

On examination, he was seen to have an anxious expression, and he gave an exaggerated response to slight stimulation. His posture and gait suggested hysteria. Painful limitation of flexion of the right hip joint was noted. The thoracic and lumbar vertebræ were immobile. Anæsthesia of his right side was present. The abdominal reflexes, the plantar reflexes, the knee jerks and the ankle jerks were present and equal on both sides, and not exaggerated. From the two military hospitals at which he had previously been treated reports on his condition were received. In the first report it was stated that spasm of the muscles round the right hip joint and exaggerated tenderness of all the muscles of the lumbar region and of the abdominal muscles were present, but that there was no limitation of movement of the spinal joints; the response to all examinations suggested over-action, and the provisional diagnosis was "anxiety state". In the second report it was stated that tenderness was present over the lower part of the right half of the chest wall anteriorly (ribs and intercostal spaces), over the right half of the abdominal wall, over the lower half of the dorsal section of the spine, over the right *erector spinæ* muscle and over the right half of the chest wall posteriorly; back movement was limited; flexion at the right hip joint was slightly limited; there was no disturbance of the arm or leg reflexes; the provisional diagnosis was "traumatic neurasthenia".

X-ray examination failed to reveal any lesion of the right hip joint or the dorsal vertebræ; an osteophyte was seen to be present at the first lumbar vertebra. A diagnosis of hysteria was made. Major McCarthy said that it was doubtful whether the patient had made any progress towards recovery.

Major McCarthy went on to say that it had been stated that dyspepsia and the neuroses were causing the greatest wastage of trained manpower. This was a dyspeptic war. It had also been stated that hysteria was not very evident. Major McCarthy had recently seen a neurologist diagnose seven cases of hysteria among 22 patients in the orthopædic ward of a military hospital. Hysteria following injury and blast was likely to be overlooked. The case presented was one of a gross and easily recognized hysteria with hemianæsthesia. The patient had suffered injury, physical and psychic, and his mind conceived the right side of his body as already dead.

Major McCarthy went on to say that man was born with two instincts, that of self-preservation and that of reproduction. In war, the instinct of self-preservation was continually assailed. The pattern of response to fear, real or anticipated, was primitive, and was laid down early in the history of the human race. Primitive man reacted to danger by flight or immobility. Later, when he designed weapons, he often found it advantageous to fight. Hysteria was an expression of the primitive reaction to fear in the form of immobility. The mental process was one of dissociation—the development of a water-tight compartment in the mind. Hysterics were not malingerers. The process was subconscious and was a pattern of response to the urging of the instinct of self-preservation to keep away from danger. The injury got the soldier away from danger; some soldiers developed hysteria to keep away from danger. Diagnosis was not made on negative signs alone. All the neuroses—anxiety states, hysteria and obsessional neurosis—had positive signs. Ross's "Lectures on War Neurosis", and the war neurosis section of Hirst's "Medical Diseases of War" were worth reading.

Major McCarthy said that before a diagnosis of "hysterical back" was made, *nucleus pulposus* should be remembered; as was well known, disseminated sclerosis was often diagnosed as hysteria. It was wrong to diagnose an organic condition as hysteria; but an hysteric with an "organic" label was a tragedy. Bullying might succeed for a short time only. One prolonged interview was essential until not a trace of disability was left. Resistant patients responded to hypnosis. To prevent relapse, the water-tight compartment had to be broached. In Major McCarthy's opinion, plenty of hysteria was to be found.

SURGEON LIEUTENANT-COMMANDER SEWELL said that in his experience very few cases of hysteria had been reported. He thought that this was partly due to the fact that a large number of medical officers were aware of the problem. He had seen fifteen patients with proven hysteria since he had been in that area, and they had all been sent in from different units. If such patients were kept in hospital for any length of time, the hysteria became very difficult to treat. Commander Sewell considered that if one could not cure it in one sitting, the patient should immediately be referred to someone else.

CAPTAIN D. MCL. PEARCE asked what was the chance of relapse if such patients remained in the battle area, and also what was the position with regard to neuroses.

LIEUTENANT-COLONEL THOMAS said that it would be extremely difficult to do anything with the patient under discussion, his distress was so great. Major McCarthy had referred to the frequency of occurrence of neurosis. Colonel Thomas considered that there was a great deal of psychosomatic disorder in that area; he laid stress on the fact that functional complaints were prevalent in the territory and were commonly being mistaken for organic disease.

LIEUTENANT-COLONEL HALLIDAY endorsed everything that Colonel Thomas had said. He said that "fixation" on the joints, back or belly was not restricted to that area. Although they did not occur with such frequency, similar syndromes were seen overseas. The position of the regimental medical officer was one of extreme difficulty, because he was often handicapped by the lack of understanding of combatant officers. The question was a big one, and Colonel Halliday did not think that it was easy of solution. He had a suggestion to offer; regimental medical officers were really in the best position to sum up the individual, and if at a certain stage they were in doubt, then it was wise to have recourse to other opinion. That might require admission of the patient to hospital. But even when one was sure that no organic disease was present, what was to be done with the patients? Colonel Halliday believed that the real solution must come from the other side of the army. The men were not medically unfit, but psychologically inefficient. Colonel Halliday thought that a certain percentage of the men of that type should be drafted into labour battalions with no medical officer. Other groups, with intelligent handling, could be placed satisfactorily in supporting units, if due regard was paid to the recommendations of responsible medical officers.

COLONEL BEARE said that he thought such men could be roughly classed into the following three groups: (i) Those who undoubtedly had something wrong with them. It was essential that a complete and thorough physical examination should be made by the regimental medical officer as early as possible. In civil life Colonel Beare made his living by diagnosing organic disease that had previously been overlooked. It was useless to tell a man that there was nothing wrong with him unless he had been examined. It was also completely wrong to make an X-ray examination of a man because he had a pain in the stomach; such an investigation of patients of that type often increased neurotic tendencies. (ii) Those whose reaction was within normal bounds. Fear was an emotion from which everyone suffered. It was necessary to deal firmly with patients of that type—in other words, with the man who was disturbed within physiological bounds. (iii) The true psychoneurotic. Colonel Beare thought that the regimental medical officer would have to group these men into three categories.

Colonel Beare went on to say that recently he had found in THE MEDICAL JOURNAL OF AUSTRALIA an article by the late Lieutenant-Colonel Eric Cooper and Captain A. Sinclair on the subject of their experiences in dealing with that type of case in Tobruk.[1] It seemed to Colonel Beare that wonderful work had been done in that connexion in Tobruk; 273 cases were dealt with in a certain period of time, 80% being of the anxiety type and 20% being hysteria. Major McCarthy had said that hysteria had not been much reported in the present war. It had been stated that in the last

[1] This article will be found in the issue of August 1, 1942, at page 73.

war the officer class of men produced the anxiety state and the less educated other ranks produced hysteria. It might be that during the last twenty years education had been advanced to such a degree that the so-called officer class did not exist to the extent that it had done. The first point to note was that in the series of cases reported by Cooper and Sinclair there were practically no malingerers; that was due to the splendid work of the regimental medical officers and the combatant officers. It was possible that the units had been together for a considerable period of time, so that the officers knew their men well. That state of affairs, unfortunately, did not exist in the area in which the meeting was being held; in the opinion of Colonel Beare, junior officers in that area were sometimes not so interested in their men as the junior officers of the Ninth Division in Tobruk. Colonel Beare thought that an important point. Of the 273 patients to whom reference had been made by Cooper and Sinclair, approximately 80% were sent back to their units or to some similar unit. That was largely due to the work that was done in Tobruk and at general hospitals and convalescent depots. Only about 10% of these men were sent back to Australia. But from the area served by the 119th Australian General Hospital there had been a constant stream of men going southwards. Colonel Beare did not know the exact number.

LIEUTENANT-COLONEL A. W. SHEPPARD said that the number was 1,356.

Colonel Beare went on to say that one-third of the men had been sent down on account of so-called psychoneurotic conditions; such conditions in his opinion were not so much medical as non-medical—the men's hearts were not in "the game". Colonel Beare thought that it would be a good idea if the men were not drafted out of the army altogether, but drafted into another branch of it. Once again he emphasized the necessity for categorizing such men into the three groups that he had defined.

CAPTAIN J. HILL said that as a regimental medical officer he wished to have something to say on the subject. Most regimental medical officers had had no experience at all; they went straight out of hospital into the army, and some of them had not even completed their training there. They were put straight into a battalion. When the men were taken on a march, half a dozen fell out; a mile further along some more fell out, and in fact men were falling out all along the road. When that had been happening for four months, and when the same men fell out each time, the regimental medical officer began to think that there might be something wrong with the men. Captain Hill did not think that the men were sent in on their first call at the regimental aid post. With regard to the area in which the meeting was taking place, Captain Hill said that many of the units were Militia units, and the men often voiced the opinion that they had been forced there. For the fortnight preceding the meeting a wet season programme had been in operation, and for that fortnight Captain Hill's greatest number on sick parade had been twelve, because there had been some work of interest.

Lieutenant-Colonel Sheppard said that he had been most interested in the discussion, because the subjects of it had given him quite a lot of work. In that area they had formed labour companies of people classified as of standard B. Since then, it had been asked that the men be classified into several types of standard B. Colonel Sheppard thought that that had had some good effect on the men, but one point he wished to stress was the fact that many men were going to labour companies who could not stand up to any work. Their condition was entirely psychological and due to "lack of guts"; but in some cases he thought it was due to a lack of leadership. In one particular labour platoon the area commandant had 25% to 50% on sick parade; after a change of commanding officer had been effected, the same platoon had not more than 10% on sick parade. Colonel Sheppard had the word of one brigade commander that if he could change the officers of one battalion he could cut out sick parade. In another battalion one-third of the officers had been changed, and the brigade commander had told him that only about half the previous number of men appeared on sick parade. The cause was not the medical condition of the men, but their mental condition; whether the medical profession could cure that, Colonel Sheppard did not know. The only one who could cure it was the officer commanding, and if he was not prepared to do it, they would have to get someone who was. Colonel Sheppard wondered whether they were not setting too high a standard. He did not think that they could keep the standard up; they lacked manpower. If they continued evacuating men, they would soon have no one left but the hospital staff. Colonel Sheppard suggested that that should be borne in mind. They found jobs for problem children. If they were in any doubt as to whether a man could carry on, and if they did not think he was good enough for his unit, they should send him to the "G.D.D.", and he could be dealt with from there. The men managed to be sent south, and they wrote back and told their friends that it was good to be there, and the friends tried to follow.

Major McCarthy, in reply to the question that had been asked concerning the possibility of relapse in cases of hysteria, said that under war conditions there was every possibility that they would occur; once an hysteric, always an hysteric. The question of the disposal of such men had been almost answered during the discussion. His own view was that anyone who was unable to adjust himself to the trials and tribulations of civil life never made a good soldier. The same applied to anyone who had sustained a severe head injury and had the post-concussional syndrome.

Perforating Gunshot Wound of the Neck.

CAPTAIN T. W. MILES showed a patient, aged twenty-two years, who had been accidentally shot with a 0·45 revolver at a distance of six feet; he had been admitted to hospital some three hours after receiving his injury. He said that immediately after the accident both his legs were paralysed and numb, both his hands were numb, and he could not lift either arm. Within an hour, the feeling and movements in both arms were restored, and he found he could move his right foot and toes slightly.

On examination, the patient was suffering severely from shock. He had two small wounds, that of entry in the left side of the suprasternal space of Burns, that of exit inside the upper end of the vertebral border of the left scapula. Horner's syndrome was not present, but the œsophagus had been perforated by the missile; when he swallowed a mouthful of water, the fluid was observed to trickle out of the anterior wound. Diminution of excursion of the left side of the chest in comparison with the right was observed. There was no alteration of percussion note, but air entry was slightly diminished throughout the whole lung. Examination of the central nervous system disclosed that his arms and hands were normal. His right leg was paresed, and weak flexion of knee, ankle and toes could be voluntarily performed. All reflexes were absent. His left leg was in a state of complete flaccid paralysis, and all deep reflexes were absent. Protopathic, epicritic and deep sensibility were all impaired on the abdomen and in both legs. The superficial abdominal reflexes were absent. Paralysis of the urinary bladder had occurred, and overflow developed within a few hours of the patient's admission to hospital. There was no priapism.

An immediate gastrostomy of the Senn type was established under local anæsthesia, and for the next seven days all feeding was carried out by this channel. Sulphonamide therapy was instituted, the tablets ("M & B 693") being introduced powdered in milk through the gastrostomy tube.

The small puncture wounds of entry and exit of the missile were not excised, but were merely dressed with "Vaseline" gauze. An in-dwelling urethral catheter was passed, and daily bladder irrigations of oxycyanide of mercury (1/8,000) were commenced. On the fifth day an X-ray examination of the spine revealed that the left side of the bodies of the second and third dorsal vertebræ had been shattered by the missile.

As the patient's general condition had improved considerably by the seventh day, and as his cervical wounds were clean and apparently healing, oral feeding was commenced. By the fourteenth day the gastrostomy wound automatically closed after removal of the tube. From the seventh day onwards his general condition gradually deteriorated. The anterior cervical wound became infected, and pus could be expressed from it on deep pressure over the left supraclavicular area. His temperature became "hectic", and on occasions rose to 105° F. On the fourteenth day the leucocytes numbered 14,000 per cubic millimetre of blood.

Captain Miles said that the patient was being shown with an invitation to criticism of his management. It had seemed, when the patient was admitted to hospital, that the first requirement was the management of the œsophageal wound. It was assumed, as the wounds of entry and exit of the missile were small, and as the bullet (a 0·45) was not large, that the wound or wounds of the œsophagus were likewise small. Therefore, it was considered sufficient merely to establish a gastrostomy and to stop the administration of food or fluid by mouth, thereby placing the œsophagus at rest. One anticipated, if infection subsequently developed,

the occurrence of a suppurative superior mediastinitis. This had undoubtedly supervened. With regard to the diminished respiratory excursion of the left side of the chest, Captain Miles said that radiological examination revealed no pneumothorax, no rib injury, and no paralysis of the diaphragm (phrenic nerve). He did not believe that the cupola of the pleura was perforated, and the cause of the diminished excursion he did not know; any explanation would be appreciated.

With regard to the central nervous system injury, Captain Miles said that, according to the patient's own statement, the immediate loss of function was great, and improvement within a few hours was also great. This improvement, together with the fact that the wound of exit was small, had influenced him (Captain Miles) in the hope that no actual cord damage was present, and in the hope that the neurological condition was one of spinal shock only. However, the X-ray findings, together with the fact that all improvement ceased after twenty-four hours, suggested that considerable initial cord destruction had been produced by the missile.

It was thought, in view of the other injuries present, that suprapubic cystostomy was unnecessary, and that the passing of an indwelling urethral catheter would be sufficient. Captain Miles said that he would appreciate criticism of this procedure; he pointed out that the patient's urine had remained uninfected.

LIEUTENANT-COLONEL C. A. M. RENOU said that he thought the patient had mediastinitis and was desperately ill and would probably die. Colonel Renou wondered whether they should not have put a tube down his wound and instituted negative pressure drainage. Lieutenant-Colonel King had done a great deal of work on that type of thoracic surgery, and he was extremely interested in that class of case; he was quite sure that if negative pressure was instituted, as with an empyema cavity, the danger of the development of superior mediastinitis almost ceased to exist. Colonel Renou asked for comments.

CAPTAIN F. HIDDE (United States Army Medical Corps) said that he had been fortunate enough to see similar lesions, not associated with trauma, but with pyogenic and malignant conditions. In his experience the conclusion had been reached that that was the best treatment, and the sooner it was carried out, the better was the chance of recovery. It was interesting for him to see in some cases no sign of pus to begin with, drainage beginning some days later. With regard to the cord lesion of the patient under discussion, Captain Hidde said that he had not had much experience with such cases. If the wound of the œsophagus was small, the treatment was to establish a gastrostomy. If the wound in the neck was at all extensive, the œsophageal wound was closed and a drain was put in to the subcutaneous tissues only. If the œsophageal wound was large, the two ends of the œsophagus should be brought out to the surface.

MAJOR M. J. MUSSER (United States Army Medical Corps) said that he was interested in the circumstances of the patient's spinal cord injury. From an academic standpoint, they were interested in what might have happened to his spinal cord, and it was of interest that apparently with the hemisection of the cord the bladder became completely paralysed. Major Musser was rather curious as to whether or not a block existed at the level of the injury.

Patent Ductus Arteriosus with Subacute Bacterial Endarteritis.

Lieutenant-Colonel J. H. Halliday showed a soldier, aged twenty-five years, who had been a farmer in civil life and had had no illness prior to his enlistment twelve months previously in an infantry battalion. On July 1, 1942, he appeared before a medical board for enlistment in the Australian Imperial Force and was rejected on account of a congenital heart lesion. His admission to hospital was recommended. On July 6 he was admitted to hospital, and the diagnosis of patent *ductus arteriosus* was confirmed. He was discharged from hospital two days later and attached to the staff of the 119th Australian General Hospital for duty. On July 10 he was seized with sudden pain in the right axilla, which wore off after some hours. On July 11 he complained of pain in the left side of the chest; it was accentuated by breathing and accompanied by a cough.

He was readmitted to hospital. Questioning then revealed that he had not felt well for six weeks; he had been unusually fatigued at the end of a day's work, and had had some breathlessness on severe exertion. When he was first examined, he was afebrile, and no abnormal physical signs could be found in the chest, apart from the heart condition. Some hours later his temperature rose to 103° F., friction was heard in the upper part of the left axilla, and he coughed up blood-stained sputum. A provisional diagnosis of pneumonia and pleurisy was made, and sulphapyridine was given—a total of 22 grammes. On July 12 his temperature became normal, and it remained so until July 18, when he again became febrile and râles were again detected in the left axilla. Air entry into the base of the right lung posteriorly was also considerably diminished. Sulphapyridine was again administered, to a total dosage of twelve grammes. On July 22 signs of consolidation at the base of the right lung posteriorly were recorded, and a further course of sulphapyridine therapy was instituted. On July 24 his temperature again fell to normal, and it remained so for four days. A total of 27 grammes of sulphapyridine had been given in three days.

On July 28 he suddenly became febrile again, with a cough productive of blood-stained sputum. Each bout of fever was accompanied by drenching sweats. Colonel Halliday said that since July 28 the patient had had continuous fever; at first it had been irregular, but for the past fortnight his temperature had been more swinging and the elevations had become intermittent, reaching 104° F. at times. Fifteen grammes of sulphapyridine had been given between July 29 and 31; but its use was suspended after August 4, when the presence of granulopenia was discovered (33% of 4,000 leucocytes were granulocytes). On August 21, the condition of the leucocytes having improved, a further course of sulphapyridine therapy was begun.

Lieutenant-Colonel Halliday said that since the patient had come under his observation on August 3, several important points had been noted. His general nutrition had been well maintained. The action of the heart was forcible, and tachycardia was present to varying degrees. In the first and second intercostal spaces to the left of the sternum there was a loud "machinery" murmur, to and fro, with systolic intensification; the murmur did not radiate. The systolic blood pressure varied from 110 to 130 millimetres of mercury and the diastolic pressure was 60; the pressure was slightly higher in the right arm than in the left. With regard to the lungs, Colonel Halliday said that varying areas of persistent râles with diminished air entry had been present, particularly in the left axilla and at the base of the right lung posteriorly. On two occasions the spleen had seemed to be palpable. The optic fundi appeared normal. No peripheral petechiæ had been observed apart from an ecchymosis under the right thumb nail, which had been present for the period during which the patient had been under observation.

A number of special investigations were carried out. On August 3 a radiological and fluoroscopic examination of the heart and lungs was made. No abnormality was detected in the lungs. The pulmonary conus and the pulmonary artery were dilated. Some general increase in the size of the cardiac shadow was revealed in a film taken at a distance of six feet. No enlargement of the auricles was apparent. Some vascular congestion was detected in the lung fields. The findings were consistent with the presence of simple patent *ductus arteriosus*. A further radiological examination was made on August 20; the dilated pulmonary conus was well seen, and there was evidence of general cardiac failure, the size of the cardiac shadow having further increased.

The urine was examined on August 4; in the centrifuged deposit many calcium oxalate crystals were present, but no cells, casts or organisms were seen. On the same date a blood count gave the following information: the erythrocytes numbered 4,100,000 and the leucocytes 4,000 per cubic millimetre, and the hæmoglobin value was 71% (ten grammes *per centum*); of the leucocytes 33% were neutrophile cells, 43% were lymphocytes and 24% were monocytes. On August 9 a differential leucocyte count gave the following results: the leucocytes numbered 4,800 per cubic millimetre, 51% being neutrophile cells, 30% lymphocytes and 24% monocytes. A further differential leucocyte count on August 14 gave the following information: the leucocytes numbered 7,000 per cubic millimetre, 63% being neutrophile cells, 33% lymphocytes and 4% monocytes; on that date the erythrocytes numbered 5,700,000 per cubic millimetre and the hæmoglobin value was 74% (10·4 grammes *per centum*). On August 21 the leucocytes numbered 5,600 per cubic millimetre, 68% being neutrophile cells, 26% lymphocytes and 5% monocytes. On August 4 examination of a blood film revealed no malarial parasites; a large number of reticulocytes were present. An attempt at culture from the blood on August 9 resulted in no growth of organisms after ninety-six hours; the same result was obtained on attempted culture from the blood made on August 18. On August 21 the sputum was

examined; it was blood stained, but no tubercle bacilli were seen, although streptococci were present in profuse numbers.[1]

Lieutenant-Colonel Halliday said that continued patency of the *ductus arteriosus*, which normally closed in the first few weeks of life, was one of the commonest congenital abnormalities of the heart met with in practice. In a certain number of cases the anomaly was associated with other defects, such as coarctation of the aorta and deficient septa. In the case under discussion the two cardinal signs of this condition were present—namely, the characteristic "machinery" murmur and the abnormal outline of the pulmonary conus and artery seen in the X-ray film. The condition was essentially an arterio-venous shunt, exactly comparable in its effects on the heart and circulation to a traumatic arterio-venous aneurysm; in other words, the bigger the shunt, and the closer to the heart, the greater was the disturbance of the circulation and the earlier the onset of cardiac failure. In Maude Abbott's series of cases of the condition, the average length of life was twenty-four years, and the cause of death in nearly half the cases was cardiac failure. The other main cause of death was subacute bacterial endarteritis, which occurred in about 25% of cases. Colonel Halliday pointed out that the evidence in favour of that complication in the case under discussion was somewhat incomplete, inasmuch as up to the time of the meeting attempts at blood culture had failed. He said that it was thought by some workers that the previous exhibition of sulphonamide drugs might be responsible for the failure to grow organisms from the blood, and it had been suggested that paraaminobenzoic acid should be added to the culture medium to counteract the bacteriostatic action of the drugs. Colonel Halliday went on to say that ligation of the duct had been successfully performed for some years in uncomplicated cases. During the last two years a series of cases had been reported in the American literature, in which the duct had been ligated after bacterial endarteritis had supervened. Apparently complete cure had been achieved in those cases. It appeared that in early cases at least, surgical intervention offered a new chance of recovery from an otherwise lethal condition.

Lieutenant-Colonel Thomas said that the case was one of great interest, and he agreed with the diagnosis. He said that they always looked for evidence of some accompanying abnormality, but in the case under discussion none seemed to be present. The question of the development of superimposed bacterial infection on congenital defects was one that had interested him for years. The day might come when those subjects of the condition who reached adult life without gross disability might be able to be cured by surgical treatment.

CAPTAIN W. G. HEASLIP said that the question of blood culture was one of extreme difficulty. It had been recorded that one pathologist working in a laboratory reported 100% success from cultural examinations, whereas his successor, using the same methods, was able to record only 30% success. Nobody seemed to know the reason for the varying results. In America a higher percentage of positive results was recorded than in Great Britain. In Germany there were two schools, one associated with a large percentage of positive results, the other with a small percentage.

[1] On August 23 this soldier became slightly jaundiced and his condition rapidly deteriorated. Coma supervened twenty-four hours later, and he died on August 25. Blood taken for cultural examination on August 21 yielded a growth of *Streptococcus viridans* after one week. A post-mortem examination was made on August 25 by Captain W. G. Heaslip, with the following findings. The body was that of a young, well-nourished man; *rigor mortis* had almost passed off. Slight icterus was apparent, but there were no other significant external appearances. The abdominal cavity appeared normal. There were numerous small, hæmorrhagic areas in the mediastinal connective tissue. The heart and lungs were removed *in toto*. The trachea contained dark, blood-stained fluid, and there were about two ounces of blood-stained fluid in the right pleural cavity. A recent adhesion was found in the left pleural cavity, at the level of the apex of the heart, five inches from the mid-sternal line. Examination of the right lung revealed acute congestion of the lower and middle lobes, less acute in the upper lobe; purulent fluid was present in the bronchi. Examination of the left lung disclosed congestion of the lower lobe; there was an area of infarction on the anterior surface of the upper lobe, two inches from the lateral border and three inches from the apex, which was roughly circular, firm, raised, dark red in colour and about 1·75 inches in diameter. On the lower lobe there was a similar, older area on the anterior edge, corresponding with the site of the pleural adhesion. Examination of a section of this area revealed a dark centre surrounded by an area of diminishing congestion. Dissection of the heart revealed a patent *ductus arteriosus* three-eighths of an inch long and having an internal diameter of three-sixteenths of an inch. At the junction of the *ductus arteriosus* and the pulmonary artery, on the cardiac side of the opening, there was a mobile vegetation three-eighths of an inch long and a quarter of an inch wide at its greatest diameter. Opposite the orifice of the right branch was a line of mobile vegetations one and a half inches long and on a base a quarter of an inch wide. The distal end of the line was opposite the vegetation at the opening of the *ductus arteriosis*. The longest of these vegetations measured three-quarters of an inch. Otherwise the heart, valves and vessels appeared normal. Flame-shaped hæmorrhages were found scattered throughout the mesentery. The spleen was firm, but about three times the normal size; examination of sections revealed no gross changes. The liver, the adrenal glands and the kidneys appeared normal. The pancreas was very small; its dimensions were three inches by one inch by half an inch, but otherwise it appeared normal. No abnormality was found on macroscopic examination of the meninges or the brain.

Post-Graduate Work.

LECTURES IN SYDNEY.

THE New South Wales Post-Graduate Committee in Medicine announces that a course of lectures is being held from 4.30 to 6 p.m. each Monday afternoon at the Stawell Hall, Royal Australasian College of Physicians, 145, Macquarie Street, Sydney. The programme is as follows:

Monday, March 15, 1943.

Three papers by members of the 118th (Johns Hopkins) Hospital Unit, American Army.

1. "Recent Experiments with the new Antiseptic Zephiran", by Captain Harris B. Shumacker, junior.
2. "Surgery of Carcinoma of the Head of the Pancreas", by Lieutenant-Colonel I. R. Trimble.
3. "The Early X-Ray Diagnosis of Pulmonary Tuberculosis", by Major Whitmer B. Firor.

Monday, March 22, 1943.

"The Surgery of Head Injuries", by Lieutenant-Colonel I. D. Miller.

Monday, March 29, 1943.

Medical Films.

1. Film on "The Time Factor in the Treatment of Burns", from the 115th Australian General Hospital, to be shown by courtesy of the Army Medical Service.
2. "Facial Maxillary Injuries", by Dr. New and Dr. Erich.
3. "Essential Hypertension: Splanchnic Nerve Resection", by Dr. Adson.
4. "Diaphragmatic Hernia", by Dr. S. W. Harrington.

Films 2, 3 and 4 have been kindly lent to the committee by the Mayo Clinic, Rochester, Minnesota, United States of America.

Monday, April 5, 1943.

"Intravenous Therapy in Hæmorrhage, Burns and Shock", by Major R. J. Walsh.

Monday, April 12, 1943.

Programme to be arranged.

Monday, April 19, 1943.

Programme to be arranged.

To defray the expenses of these lectures the committee has decided to charge a fee of £1 1s. for attendance at more than four lectures in the course, and 10s. 6d. for four or less. Members of the Australian and Allied Forces will be admitted free of charge. Those wishing to attend should make application to the Secretary, New South Wales Post-Graduate Committee in Medicine, 145, Macquarie Street, Sydney, or arrange at the post-graduate office just prior to the lectures.

WARD ROUNDS FOR MEMBERS OF THE AUSTRALIAN AND ALLIED FORCES.

ARRANGEMENTS have been made for a number of medical officers of the Australian and Allied Forces to attend hospital ward rounds at the Royal Prince Alfred Hospital, Camperdown, on each Tuesday afternoon at 4 o'clock. The number

for attendance is limited and those who wish to attend should communicate with the Secretary of the Post-Graduate Committee, 145, Macquarie Street, Sydney.

All inquiries regarding post-graduate instruction in any subject should be made to the Secretary of the Post-Graduate Committee, 145, Macquarie Street, Sydney. Telephone B 4606.

Correspondence.

TRAUMATIC SHOCK.[1]

SIR: The orthodox conception of traumatic shock, so well expounded in the Supplement on War Medicine and Surgery (1942), attaches only secondary importance to the influence of neurogenic factors. I am encouraged, however, by the recently published work of Stern (1942) to draw attention to this aspect of shock. A good deal of evidence has accumulated to suggest that the first step in shock is mediated by nervous reflexes, and that its observable effects, such as reduction of the blood volume, are but secondary.

Tomb (1942) has ably stated the case in favour of the reflex origin of shock, which, he says, is brought about by abnormal nervous stimuli originating in the injured tissues. The work of O'Shaughnessy and Slome (1935) was largely responsible for the abandonment of the histamine theory, but the later efforts of these workers (Slome and O'Shaughnessy, 1938) seem to have escaped general recognition. In dogs whose limbs had been crushed, transfusion could not avert the fatal decline in blood pressure. Death occurred even if the limb had previously been completely excluded from the circulation; if the nerves had been sectioned, however, no decline took place. Spinal anæsthesia administered before the injury was also found to avert the fatal issue, as did denervation of the limb leaving the circulation intact. Slome and O'Shaughnessey were able to demonstrate abnormal action currents in the sciatic nerve of the crushed limb, centripetal, and commencing about one hour after the occurrence of the injury. They considered that these abnormal impulses originated in the injured tissues and caused depression of vital centres in the central nervous system.

More recently this work has been confirmed by Lorber, Kabat and Welte (1940), who repeated the experiments using safeguards which eliminated certain possible sources of error. Leveuf (1940), who also favours the nervous theory, reports evidence of vascular engorgement of centres in the floor of the third ventricle. In support of the theory, Pickerill (1942) claims good results from the infiltration of burns with local anæsthetic, and the Russians, Vishnevskiy (1942) and Novikov (1942), claim "magical" effects from the local infiltration of extensive injuries.

Tomb has made out a very good case in favour of spinal anæsthesia as a preventive of shock; he is supported in this by Freedman and Kabat (1940), who warded it off in an animal by transecting the cord before injuring the legs, and by Koster, Shapiro and Goldberg (1941), who point out the many clinical differences between shock and the effects of local anæsthesia. In fact, the only similarity is the fall in blood pressure; but in shock it falls late and tends to be irreversible, whereas with spinal anæsthesia it falls immediately and is reversible. Though the assertion often is made that spinal anæsthesia is contraindicated in shock, it is not supported by the clinical experience of many surgeons who choose a combination of spinal analgesia with "Pentothal" when exploring the abdomen of a collapsed patient.

Commenting editorially on Stern's work, the *British Medical Journal* (1942) says that "gradual deterioration . . . in spite of repeated transfusions of blood or of blood substitutes is only too painfully familiar". The theory of the osmotic pressure of the plasma proteins, on which serum therapy rests, has been jeopardized by the discovery of Beattie (1942) and others that injected plasma proteins quickly pass out into the tissues. Beattie found also that, concurrently with the physiological restoration of the blood volume after hæmorrhage, proteins were taken up from the tissues in quantities just sufficient to keep the level normal in the plasma.

Dr. Stern, of Moscow, attributes the poor results in the treatment of shock to the neglect of the nervous factor, and she claims to have dissipated all of its signs by injecting into the ventricles a solution of potassium phosphate, which produces excitation of the vegetative nerve centres. Confirmation of her results will be awaited with interest.

Yours, etc.,

M. KELLY,
Captain, Australian Army
Medical Corps.

Perth,
Western Australia,
February 20, 1943.

[1] The references appended to Captain Kelly's letter have been omitted owing to lack of space.—EDITOR.

THE DYSENTERIES.

SIR: In your journal of February 20, 1943, Dr. W. L. Calov in his excellent article on "The Dysenteries" states that "Many people who have once had dysentery are subject to bouts of functional diarrhœa", and again he states that as a sequel to bacillary dysentery "The sigmoid colon is spastic and readily palpable". Now, sir, my experience of bacillary dysentery in New Guinea, such as it may have been, has led me to believe that such a functional diarrhœa as a sequel to bacillary dysentery is rare indeed; the spastic palpable colon I never encountered as a sequel to such a dysentery.

Might I venture the tentative suggestion that such diarrhœas are evidence of chronic amœbic dysentery; here I offer my apologies to Dr. Calov for such an opinion, but assure him that even the very best protozoologists may have great difficulty in demonstrating the *Amœba histolytica* or her cysts in these chronic cases.

As in malaria we have the hazard of the negative blood film, so in these dysenteries we have the hazard of the negative fæcal examination. We resort to treatment for a final test. Again, sir, I have been taught that in these cases of recurrent diarrhœa, a palpable sigmoid is suggestive of chronic amœbic dysentery. Manson-Bahr (*British Medical Journal*, August 23, 1941) states that in his 535 proved cases of chronic amœbic dysentery in 212 peri-colonic infiltration of sigmoid was present with a palpable sigmoid. What a splendid indication for eliminative treatment this sign of the sigmoid is. It almosts asks for retention enemas of "Yatren", or its substitutes, with emetine bismuth iodide to help things from above. As Dr. Calov points out in his paper, it is important to have the emetine-bismuth iodide in gelatin capsules, but, sir, why is it that as far as I am aware only Burroughs Wellcome stearin coated tabloids are available in Sydney?

Yours, etc.,

W. E. GIBLIN.

Wahroonga Avenue,
Wahroonga,
New South Wales.
February 28, 1943.

THE SELECTION OF MEDICAL STUDENTS.

SIR: It has seemed extraordinary to many practitioners that there has been no protest from the British Medical Association or any other responsible body concerning the methods by which all recruits for our profession are now being selected. Dr. Swanton is the first to state publicly the many objections to the new system.

It is surely much to the detriment of the profession that students should be selected solely in order of merit, according to their marks on the leaving certificate examination. No steps are taken to find out whether the candidate is emotionally or physically suitable, or even as to whether he or she bears a good character. Also no allowance is made for the fact that a candidate may have been unwell at the time of the examination, or during the previous term, although he may have done an excellent year's work.

Many students with mediocre leaving pass marks have a keen desire to study medicine and have a greater aptitude for the profession than those with honour marks. Again, some men are earning their living in other walks of life, and are saving and studying in order to enter the ranks of the medical students; these men, who often make excellent doctors, but rarely get high marks in the entrance examinations, will also be excluded.

In the recent list of exhibitions for medicine are the names of several Continental evacuees, who, for the most part, owe their high position to the marks gained in French and German. This is hardly fair to Australian boys and girls.

The measure of financial assistance granted to intending students of medicine will not help those whose parents earn

a salary of £500 or over. Many parents, whose income is within a hundred or two of this amount, cannot now afford, because of heavy taxation and increased cost of living, to give their children a university education, especially as no relief is given to taxpayers after children are sixteen years old.

Doubtless everyone agrees that there should be a selection of students allowed to commence a medical course, if the numbers of entrants are greater than the number required, but surely the method of selection should be altered at once.

Yours, etc.,

ELLEN KENT HUGHES.

Armidale,
New South Wales,
March 1, 1943.

Naval, Military and Air Force.

DECORATIONS.

Colonel Herbert Giblin Furnell, D.S.O., A.A.M.C., and Colonel Reginald Angel Money, M.C., E.D., A.A.M.C., have been created Commanders of the Most Excellent Order of the British Empire.

Obituary.

HENRY SINCLAIR-FORDYCE.

WE regret to announce the death of Dr. Henry Sinclair-Fordyce, which occurred on March 10, 1943, at Melbourne, Victoria.

WILLIAM REGINALD DARTON.

WE regret to announce the death of Dr. William Reginald Darton, which occurred on March 12, 1943, at Kandos, New South Wales.

Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Holt, Ian Wellesley, M.B., B.S., 1939 (Univ. Sydney), 2, The Appian Way, Burwood.

The undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Ariotti, Louis Charles Anthony, M.B., 1941 (Univ. Sydney), 55, Dalhousie Street, Haberfield.

Bertinshaw, Leonard Dolan, M.B., B.S., 1942 (Univ. Sydney), 33, Crow's Nest Road, Waverton.

Dan, Alexander Morven, M.B., B.S., 1940 (Univ. Sydney), c.o. Mr. George Dan, Post Office, Katoomba.

Greenberg, Leslie Leonard, M.B., B.S., 1942 (Univ. Sydney), 99, Drumalbyn Road, Bellevue Hill.

Musso, Anthony Fidelis Vincent, M.B., B.S., 1942 (Univ. Sydney), 469, Forest Road, Penshurst.

Opie, James Gordon, M.B., 1942 (Univ. Sydney), Balmain Hospital, Balmain.

Opie, Richard Cunynghame, M.B., 1941 (Univ. Sydney), 185, Molesworth Street, Lismore.

Medical Appointments.

Dr. Harry Carew Nott has been reappointed Honorary Radiologist at the Royal Adelaide Hospital, Adelaide, South Australia.

Pursuant to the provisions of the *Pure Food Act*, 1908, of New South Wales, the undermentioned have been appointed members of the Advisory Committee for the purposes of the *Pure Food Act*: Dr. E. Sydney Morris, Dr. E. L. Morgan, Dr. H. G. Wallace, Dr. J. Grahame Drew, Dr. H. W. T. Chenhall.

Books Received.

"Plain Words: A Guide to Sex Education", by W. J. Thomas, with forewords by Dr. H. E. Burgmann, Bishop of Goulburn, and Sir James Barrett, K.B.E., C.B., C.M.G., M.D.; 1942. Sydney: F. H. Johnston Publishing Company. 7¼" × 4¾", pp. 84, with illustrations. Price: 2s. 6d.

"The 1942 Year Book of Urology", by Oswald S. Lowsley, M.D., F.A.C.S.; 1942. Chicago: The Year Book Publishers, Incorporated. 7¼" × 5", pp. 456, with illustrations. Price: $3.00, post paid.

Diary for the Month.

MAR. 23.—New South Wales Branch, B.M.A.: Council Quarterly.
MAR. 25.—New South Wales Branch, B.M.A.: Annual Meeting.
MAR. 25.—South Australian Branch, B.M.A.: Branch.
MAR. 26.—Queensland Branch, B.M.A.: Council.
MAR. 30.—New South Wales Branch, B.M.A.: Council.
APR. 1.—South Australian Branch, B.M.A.: Council.
APR. 2.—Queensland Branch, B.M.A.: Branch.
APR. 6.—New South Wales Branch, B.M.A.: Organization and Science Committee.
APR. 6.—Tasmanian Branch, B.M.A.: Branch.
APR. 7.—Western Australian Branch, B.M.A.: Council.
APR. 9.—Queensland Branch, B.M.A.: Council.
APR. 13.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
APR. 20.—New South Wales Branch, B.M.A.: Ethics Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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